



Tetra Tech EM Inc.

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January 22, 2001

Mr. Brian Freeman
U.S. Environmental Protection Agency Region 5
9th Floor, Mail Code DE-9J
77 West Jackson Boulevard
Chicago, IL 60604

Subject: Data Validation Report for Samples Collected
From October 24 through November 3, 2000
Solutia, Inc., Sauget, Illinois
EPA Contract No. 68-W9-9018, Work Assignment No. R0580711

Dear Mr. Freeman:

Tetra Tech EM Inc. (Tetra Tech) is enclosing one copy of the data validation report and one copy of the particle size analysis results for samples collected from October 24 through November 3, 2000, at the above-referenced facility in Sauget, Illinois.

If you have any questions about the enclosed data validation report, please call me at (312) 856-8721.

Sincerely,

A handwritten signature in black ink that appears to read "Lisa Graczyk".

Lisa Graczyk
Project Manager

Enclosures (2)

cc: Bernie Orenstein, EPA Regional Project Officer (letter only)
Kenneth Bardo, EPA Technical Advisor
Ed Schuessler, Tetra Tech Regional Manager (letter only)
Art Glazer, Tetra Tech Program Manager

ENCLOSURE 1

**DATA VALIDATION REPORT
FOR SEDIMENT SAMPLES
COLLECTED OCTOBER 24 THROUGH NOVEMBER 3, 2000
SOLUTIA, INC.
SAUGET, ILLINOIS**

(20 Pages)

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1.0 INTRODUCTION

This data validation report documents the analytical results for 23 sediment samples and accompanying quality control (QC) samples (rinsates and trip blanks) collected from October 24 through November 3, 2000, in the Mississippi River near the Solutia, Inc. (formerly Monsanto, Inc.), facility in Sauget, Illinois. Tetra Tech EM Inc. (Tetra Tech) collected the samples and shipped each day's samples by overnight courier to Severn Trent Laboratories, Inc. (STL; formerly known as Quanterra, Inc.), in North Canton, Ohio.

STL analyzed the samples for (1) volatile organic compounds (VOC) using U.S. Environmental Protection Agency (EPA) "Test Methods for Evaluating Solid Waste" (SW-846) Method 8260B, (2) semivolatile organic compounds (SVOC) using SW-846 Method 8270C, (3) organochlorine pesticides using SW-846 Method 8081A, (4) polychlorinated biphenyls (PCB) using SW-846 Method 8082, (5) organochlorine herbicides using SW-846 Method 8151A, (6) organophosphorus pesticides using SW-846 Method 8141A, and (7) total organic carbon (TOC) using the Walkley-Black method described in "Methods of Soil Analysis, Chemical and Microbiological Properties." STL (North Canton) sent portions of each sample to the STL facility in Colchester, Vermont, for particle size analysis by American Society for Testing and Materials (ASTM) Method D422; this geotechnical test is outside the scope of this data validation. STL assigned each shipment of samples a separate lot number and submitted a separate data package for each lot, although several lots were analyzed together.

Tetra Tech evaluated STL's data package for the samples in accordance with EPA's Contract Laboratory Program (CLP) National Functional Guidelines for Organic Review, dated October 1999. The parameters used for the evaluation are listed below.

- Data package completeness

- Sample holding time
- Instrument calibration
- Blank results
- Matrix spike/matrix spike duplicate (MS/MSD) results
- Laboratory control sample (LCS) results
- Method-specific QC results
- Analyte identification
- Analyte quantitation

Sections 2.0 through 8.0 discuss the results of the data validation for each analysis with emphasis on any problems observed. Section 9.0 provides an overall evaluation of the analyses performed. Table 1 summarizes the validated analytical results for the split samples; and Table 2 summarizes the validated analytical results for the river sediment samples which were not splits.

2.0 VOLATILE ORGANIC COMPOUND ANALYSIS

The VOC analyses had no problems with sample holding times, LCS results, method-specific QC results, and analyte identification. Because samples effervesced when mixed with sodium bisulfate, they were preserved in the laboratory by freezing. Note that the laboratory found it necessary to prepare some samples by the medium level method (extracting with methanol), thus increasing the sample reporting limits.

In most analytical runs, acrolein, vinyl acetate, and sometimes other analytes had continuing calibration results that exceeded the QC limit of a 25 percent difference from the initial calibration result. None of these analytes were found in any sample, so no qualifications are given in the tables.

Most of the laboratory blanks and field blanks (trip blanks and a rinsate blank) contained acetone and methylene chloride. Blanks accompanying the split samples also contained benzene. The similar concentrations found in associated samples are flagged "U" as laboratory artifacts. The rinsate sample also contained some chloroform and isopropyl alcohol. These two analytes were not found in any sediment samples so no qualifications are needed.

Matrix spike analyses were performed on sample MR-SD-4-90. There was excessive recovery, variation, or both for benzene, toluene, and chlorobenzene, the three aromatic compounds in the spike. The report narrative noted that a reanalysis gave acceptable results. This reanalysis also found a much lower concentration of chlorobenzene in the unspiked sample, employing heterogenous distributions of contaminants. However, raw data for the reanalyses was not included in the data package. Therefore, only the original results can be used for data validation. All aromatic compounds in the parent sample are flagged "J" as appropriate. All results from the MS analyses on split sample PDA-8-60 were acceptable.

Some samples had results less than the sample reporting limit, which corresponds to the lowest calibration standard. These extrapolations are flagged "J" as estimates.

3.0 SEMIVOLATILE ORGANIC COMPOUND ANALYSIS

The SVOC analyses had no problems with data package completeness and MS/MSD results. When the first shipments were sent, the sampler did not note that SVOC analyses were to be performed. Therefore, sediment samples PDA-2-60, PDA-5-R-60, PDA-8-60, MR-SD-8-57, and MR-SD-9-51 were not extracted until the error was discovered and the laboratory notified. The samples were extracted more than 30 days after collection, well after expiration of the holding time. Because the samples were held in shipment and at the laboratory at a temperature below that of the environment they were taken from, no qualifications are warranted.

During the initial and continuing calibrations, some analytes gave results outside QC limits. These included benzoic acid; 2,4-dinitrophenol; famphur; 4-nitroquinoline-1-oxide; and other compounds that frequently give irregular responses. None of these were found in any samples, so no qualifications are given in the tables.

The laboratory blanks and rinsate blanks contained a number of nontarget compounds, as did the sediment samples. Because nontarget compounds are not reported here, no qualifications are warranted. bis(2-ethylhexyl)phthalate was reported in one sediment sample but in no other sample, including laboratory blanks. The result may represent real environmental contamination or may be an artifact.

The aqueous LCS accompanying the rinsate sample had low recoveries for pentachlorophenol and 4-nitrophenol. No acidic compounds were found in the field samples so no qualifications are applied.

The daily tuning of the instrument also included a check for excessive trailing by pentachlorophenol and benzidine. All results were acceptable.

There was a slightly low recovery of one surrogate from the rinsate sample (18 percent versus QC limits of 21 to 122 percent) and very low recoveries (5 to 12 percent) of all six surrogates from sample MR-SD-7-45. Both samples were reanalyzed with fully acceptable surrogate recoveries. The re-extractions were performed after expiration of the holding period. Table 1 gives results from the reanalysis with no qualifications.

Analyte identification was usually satisfactory. The chromatographic peak of the 4-chloroaniline found in several sediment samples is actually two overlapping peaks. Both peaks gave essentially identical mass spectra. It is probable that the second peak is 2-chloroaniline. STL did a good job of splitting the confounded peaks; the first, larger portion is ascribed to 4-chloroaniline. The ascription is probably correct, because the commercial synthesis process favors production of the para isomer. However, the peak separation is always uncertain, so the 4-chloroaniline results are all considered to be estimates. Fully separating the isomers would require a different chromatographic column.

In split sample PDA-2-60, a peak appeared to be closer to the expected retention time for 4-methylphenol than the time for 3-methylphenol. (The reported times are only 9.009 minutes apart.) The sample mass spectrum was an excellent match to the reference spectrum for 3-methylphenol but a poor match to its isomer. Therefore, this result is deemed to be 3-methylphenol.

Split sample PDA-5-R-60 showed much interference, partially alleviated by analysis at a two-fold dilution. The mass spectra for aniline and phenol had some extra lines from interferents, but the target compound lines predominated. Therefore, the identifications are accepted but the results are flagged "J" as estimates. The mass spectra for 2,6-dichlorophenol and 2,4,6-trichlorophenol were very poor matches to the reference spectra, with the major lines from the interferents. These results are flagged "U" as nondetected.

As with the VOC analysis, some positive results are less than their samples reporting limits and are qualified as estimates.

4.0 ORGANOCHLORINE PESTICIDE ANALYSIS

The organochlorine pesticide analyses had no problems with data package completeness, sample holding times, blank results, and LCS results.

In the initial calibrations, STL used quadratic curves to extend the useful range for some analytes. In most continuing calibration analyses, a few peaks were outside QC limits on one column but within limits on the other. Because positive results could be quantified on an in-control column, no qualifications are warranted.

The MS/MSD analyses on sample MR-SD-4-90 gave extremely high recoveries (700 and 640 percent) for heptachlor. There is no apparent reason for this anomaly, so the results for that compound in the parent sample are flagged "UJ" as an estimate.

Occasional surrogate results were outside control limits. Similar irregularities were seen with LCS results and laboratory blanks. No qualifications are warranted.

Sample MR-SD-4-90 contains many small peaks. It is possible that one or both of the pesticides identified in this sample are false positives. The results for both are less than the sample reporting limit, so they are flagged as estimates. Split sample PDA-5-R also contained many small peaks. Results for delta-BHC for the two columns were quite different because of varying interferents, so they are flagged "J" as estimates. Split sample PDA-8-60 was similar and therefore, delta-BHC was similarly qualified.

A few extracts were analyzed at dilutions due to interference from nontarget compounds. These results have raised reporting limits.

5.0 POLYCHLORINATED BIPHENYL ANALYSIS

The PCB analyses had no problems with data package completeness, sample holding times, blank results, MS/MSD results, and LCS results.

There were some continuing calibration irregularities with some of the five peaks used for quantitating each Aroclor, but no problems with the average results, so no qualifications are warranted.

Again, surrogate irregularities were seen in field and laboratory samples and no qualifications will be applied.

The PCB in sample MR-SD-6-90 was a good match to the calibration standard. However, the other positive results were very poor matches, as shown by the variation in quantitation from the five peaks. Therefore, the positive results for samples MR-SD-5-150, MR-SD-7-150, and PDA-5-R are flagged "J" as estimates. These PCB results are probably the degraded remains of more chlorinated mixtures.

As elsewhere, positive results less than the sample reporting limits are flagged "J" as estimates.

6.0 ORGANOPHOSPHORUS PESTICIDE ANALYSIS

The organophosphorus pesticide analyses had no problems with data package completeness, sample holding time, blank results, LCS results, method-specific QC results, analyte identification, and analyte quantitation.

Interference from nontarget compounds required a 20-fold dilution factor for split sample PDA-2-60, resulting in high sample reporting limits.

All initial calibrations were calculated as quadratic curves. In one analytical run, continuing calibration results for dimethoate, disulfoton, methyl parathion, and phorate were outside QC results on both columns. Results for those pesticides in associated samples are flagged "UJ" to indicate that the reporting limits are estimates.

In the MS/MSD analyses on sample MR-SD-4-90, recoveries from the MS sample varied from 340 to 960 percent while those from the MSD sample varied from 187 to 191 percent. Although laboratory error is possible, there is no obvious reason for these irregularities. All results in the parent sample are flagged "UJ" as estimated reporting limits.

7.0 CHLORINATED HERBICIDE ANALYSIS

The chlorinated herbicide analyses had no problems with data package completeness, holding times, blank results, MS/MSD results, LCS results, method-specific QC results, analyte identification, and analyte quantitation.

During calibration, a few analytes (mostly ones that were not required as analytes for these samples) had out of control results on one column, but not the other. No qualifications are warranted.

8.0 TOTAL ORGANIC CARBON ANALYSIS

The TOC analyses had no problems with data package completeness, sample holding times, instrument calibration, LCS results, analyte identification, and analyte quantitation. The method does not use MS analyses, but all laboratory duplicate results were acceptable.

The rinsate blank contained trace levels of TOC, but all sediment samples contained either much more TOC or no measurable TOC at all. Therefore, no qualifications are warranted.

9.0 OVERALL EVALUATION

The field duplicate pairs gave quite different results. Results from MR-SD-3-99 and its field duplicate were generally nondetect or practically identical. In contrast, sample MR-SD-6-90 had less of the VOC and SVOC analytes that its field duplicate contained, but more TOC. These results imply that at least some analytes have a heterogenous distribution in the sediment.

With the possible exception of contaminant distribution, there were no significant problems with the samples. There were no major problems with the analyses that would require rejection of data. The results in Table 1 may be used as qualified, for any purpose.

TABLE 1
VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SPLIT SAMPLES

Sample Identification	PDA-2-60	PDA-5-R-60	PDA-8-60
Date Collected	October 25, 2000	October 24, 2000	October 26, 2000
Volatile Organic Compounds (micrograms per kilogram [$\mu\text{g}/\text{kg}$])			
Acetone	5,800 U	3,300U	1,400 U
Benzene	1,100 U	260 U	3.40 U
Chlorobenzene	10,000	450	700
1,2-Dichloroethane	1,100 U	110 J	41 J
Methylene chloride	1,100 U	260 U	340 U
Toluene	12,000	140 J	340 U
Xylenes (total)	1,100 U	120 J	340 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)			
Aniline	210 J	3,900 J	410 U
4-Chloroaniline	720	3,300	410 U
2-Chlorophenol	580 U	400 J	410 U
1,2-Dichlorobenzene	120 J	780 U	410 U
1,4-Dichlorobenzene	390 J	780 U	410 U
2,4-Dichlorophenol	580 U	610 J	410 U
3-Methylphenol	95 J	780 U	410 U
Phenol	580 U	3,200 J	410 U
2,4,6-Trichlorophenol	580 U	780 U	410 U
2,6-Dichlorophenol	580 U	780 U	410 U
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)			
Aldrin	6.0 U	4.0 U	2.1 U
alpha-BHC	6.0 U	4.0 U	2.1 U
beta-BHC	6.0 U	4.0 U	2.1 U
delta-BHC	6.0 U	44 J	5.1 J
gamma-BHC (lindane)	6.0 U	4.0 U	2.1 U
Chlordane (technical)	60 U	40 U	21 U
Chlorobenzilate	120 U	21 J	41 U
4,4-DDD	6.0 U	14	2.1 U
4,4-DDE	6.0 U	4.0 U	2.1 U
4,4-DDT	6.0 U	4.0 U	2.1 U
Diallate	120 U	78 U	41 U
Dieldrin	6.0 U	4.0 U	2.1 U

TABLE 1 (continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SPLIT SAMPLES**

Sample Identification	PDA-2-60	PDA-5-R-60	PDA-8-60
Date Collected	October 25, 2000	October 24, 2000	October 26, 2000
Organochlorine Pesticides (µg/kg) (Continued)			
Endosulfan I	6.0 U	4.0 U	2.1 U
Endosulfan II	6.0 U	4.0 U	2.1 U
Endosulfan sulfate	6.0 U	4.0 U	2.1 U
Endrin	6.0 U	4.0 U	2.1 U
Endrin aldehyde	6.0 U	4.0 U	2.1 U
Heptachlor	6.0 U	4.0 U	2.1 U
Heptachlor epoxide	6.0 U	4.0 U	2.1 U
Isodrin	12 U	7.8 U	4.1 U
Kepone	120 U	78 U	41 U
Methoxychlor	12 U	7.8 U	4.1 U
Toxaphene	230 U	160 U	83 U
Polychlorinated Biphenyls (PCB) (µg/kg)			
Aroclor 1016	58 U	39 U	41 U
Aroclor 1221	58 U	39 U	41 U
Aroclor 1232	58 U	39 U	41 U
Aroclor 1242	58 U	39 U	41 U
Aroclor 1248	58 U	84 J	41 U
Aroclor 1254	58 U	39 U	41 U
Aroclor 1260	58 U	39 U	41 U
Herbicides (µg/kg)			
2,4-D	140 U	790	99 U
2,4,5-TP (Silvex)	35 U	24 U	25 U
2,4,5-T	35 U	24 U	25 U
Organophosphorus Pesticides (µg/kg)			
Dimethoate	1,200 U	39 U	41 U
Disulfoton	1,200 U	39 U	41 U
Famphur	1,200 U	39 U	41 U
Methyl parathion	1,200 U	39 U	41 U
Phorate	1,200 U	39 U	41 U
Tetraethylthiopyrophosphate	1,200 U	39 U	41 U
Thionazin	1,200 U	39 U	41 U
o,o,o-Triethylphosphorothioate	1,200 U	39 U	41 U

TABLE 1 (continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SPLIT SAMPLES

Sample Identification	PDA-2-60	PDA-5-R-60	PDA-8-60
Date Collected	October 25, 2000	October 24, 2000	October 26, 2000
General Chemistry (milligram per kilogram)			
Total organic carbon	11,000	390	510

Notes:

- J = The result was estimated for quality control reasons.
U = The analyte was not detected; the numerical value is the sample reporting limit.
UJ = The analyte was not detected; the sample reporting limit is estimated for quality control reasons.

TABLE 2
VALIDATED ANALYTICAL RESULTS FOR SOLUTIA INC. SEDIMENT SAMPLES

Sample Identification	MR-SD-1-50	MR-SD-1-150	MR-SD-1-300	MR-SD-2-50	MR-SD-2-150
Date Collected	November 1, 2000				
Volatile Organic Compounds (micrograms per kilogram [$\mu\text{g}/\text{kg}$])					
Acetone	22 U	22 U	26 U	24 U	1,300 U
Benzene	5.5 U	5.4 U	6.4 U	5.9 U	55 J
Chlorobenzene	5.5 U	5.4 U	6.4 U	6.5	390
Chloroform	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Ethylbenzene	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Methylene chloride	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Xylenes (total)	5.5 U	5.4 U	6.4 U	5.9 U	300 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)					
Aniline	400 U	390 U	390 U	400 U	400 U
bis(2-Ethylhexyl)phthalate	400 U	390 U	390 U	400 U	400 U
4-Chloroaniline	400 U	390 U	390 U	400 U	99 J
1,2-Dichlorobenzene	400 U	390 U	390 U	400 U	400 U
1,3-Dichlorobenzene	400 U	390 U	390 U	400 U	400 U
1,4-Dichlorobenzene	400 U	390 U	390 U	400 U	400 U
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)					
Aldrin	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
alpha-BHC	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
beta-BHC	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
delta-BHC	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
gamma-BHC (lindane)	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Chlordane (technical)	20 U	20 U	20 U	21 U	20 U
Chlorobenzilate	40 U	39 U	39 U	40 U	40 U
4,4-DDD	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
4,4-DDE	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
4,4-DDT	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Diallate	40 U	39 U	39 U	40 U	40 U
Dieldrin	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endosulfan I	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endosulfan II	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endosulfan sulfate	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-1-50	MR-SD-1-150	MR-SD-1-300	MR-SD-2-50	MR-SD-2-150
Date Collected	November 1, 2000				
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Endrin aldehyde	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Heptachlor	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Heptachlor epoxide	2.0 U	2.0 U	2.0 U	2.1 U	2.0 U
Isodrin	4.0 U	3.9 U	3.9 U	4.0 U	4.0 U
Kepone	40 U	39 U	39 U	40 U	40 U
Methoxychlor	4.0 U	3.9 U	3.9 U	4.0 U	4.0 U
Toxaphene	80 U	80 U	79 U	81 U	81 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	40 U	39 U	39 U	40 U	40 U
Aroclor 1221	40 U	39 U	39 U	40 U	40 U
Aroclor 1232	40 U	39 U	39 U	40 U	40 U
Aroclor 1242	40 U	39 U	39 U	40 U	40 U
Aroclor 1248	40 U	39 U	39 U	40 U	40 U
Aroclor 1254	40 U	39 U	39 U	40 U	40 U
Aroclor 1260	40 U	39 U	39 U	40 U	40 U
Herbicides (µg/kg)					
2,4-D	96 U	95 U	94 U	97 U	96 U
2,4,5-TP (Silvex)	24 U	24 U	24 U	24 U	24 U
2,4,5-T	24 U	24 U	24 U	24 U	24 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	40 U	39 U	39 U	40 U	40 U
Disulfoton	40 U	39 U	39 U	40 U	40 U
Famphur	40 U	39 U	39 U	40 U	40 U
Methyl parathion	40 U	39 U	39 U	40 U	40 U
Phorate	40 U	39 U	39 U	40 U	40 U
Tetraethylthiopyrophosphate	40 U	39 U	39 U	40 U	40 U
Thionazin	40 U	39 U	39 U	40 U	40 U
o,o,o-Triethylphosphorothioate	40 U	39 U	39 U	40 U	40 U
General Chemistry (milligram per kilogram)					
Total organic carbon	120 U	120 U	120 U	120 U	120 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-2-330	MR-SD-3-25*	MR-SD-3-99	MR-SD-4-90	MR-SD-POP-90
Date Collected	November 1, 2000	November 2, 2000			
Volatile Organic Compounds (micrograms per kilogram [µg/kg])					
Acetone	21 U	30 U	160 U	26 U	28 U
Benzene	5.3 U	7.5 U	16 U	4.2 J	7.1 U
Chlorobenzene	5.3 U	7.5 U	3.3 J	100 J	7.1 U
Chloroform	5.3 U	7.5 U	16 U	6.5 U	7.1 U
Ethylbenzene	5.3 U	7.5 U	16 U	2.0 J	7.1 U
Methylene chloride	5.3 U	7.5 U	16 U	6.5 U	7.1 U
Xylenes (total)	5.3 U	7.5 U	16 U	2.6 J	7.1 U
Semivolatile Organic Compounds (µg/kg)					
Aniline	380 U	440	220 J	400 U	410 U
bis(2-Ethylhexyl)phthalate	380 U	390 U	390 U	400 U	410 U
4-Chloroaniline	380 U	390 U	130 J	400 U	410 U
1,2-Dichlorobenzene	380 U	390 U	390 U	400 U	410 U
1,3-Dichlorobenzene	380 U	390 U	390 U	400 U	410 U
1,4-Dichlorobenzene	380 U	390 U	390 U	400 U	410 U
Organochlorine Pesticides (µg/kg)					
Aldrin	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
alpha-BHC	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
beta-BHC	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
delta-BHC	2.0 U	2.0 U	2.0 U	3.7 J	2.1 U
gamma-BHC (lindane)	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Chlordane (technical)	20 U	20 U	20 U	41 U	21 U
Chlorobenzilate	38 U	39 U	39 U	79 U	41 U
4,4-DDD	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
4,4-DDE	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
4,4-DDT	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Diallate	38 U	39 U	39 U	79 U	41 U
Dieldrin	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endosulfan I	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endosulfan II	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endosulfan sulfate	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-2-330	MR-SD-3-25*	MR-SD-3-99	MR-SD-4-90	MR-SD-POP-90
Date Collected	November 1, 2000	November 2, 2000			
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Endrin aldehyde	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Heptachlor	2.0 U	2.0 U	2.0 U	4.1 UJ	2.1 U
Heptachlor epoxide	2.0 U	2.0 U	2.0 U	4.1 U	2.1 U
Isodrin	3.8 U	3.9 U	3.9 U	7.9 U	4.1 U
Kepone	38 U	39 U	39 U	79 U	41 U
Methoxychlor	3.8 U	3.9 U	3.9 U	3.4 J	4.1 U
Toxaphene	78 U	80 U	80 U	160 U	84 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	38 U	39 U	39 U	40 U	41 U
Aroclor 1221	38 U	39 U	39 U	40 U	41 U
Aroclor 1232	38 U	39 U	39 U	40 U	41 U
Aroclor 1242	38 U	39 U	39 U	40 U	41 U
Aroclor 1248	38 U	39 U	39 U	40 U	41 U
Aroclor 1254	38 U	39 U	39 U	40 U	41 U
Aroclor 1260	38 U	39 U	39 U	40 U	41 U
Herbicides (µg/kg)					
2,4-D	93 U	96 U	95 U	96 U	100 U
2,4,5-TP (Silvex)	23 U	24 U	24 U	24 U	25 U
2,4,5-T	23 U	24 U	24 U	24 U	25 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Disulfoton	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Famphur	38 U	39 U	39 U	40 UJ	41 U
Methyl parathion	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Phorate	38 U	39 UJ	39 UJ	40 UJ	41 UJ
Tetraethylthiopyrophosphate	38 U	39 U	39 U	40 UJ	41 U
Thionazin	38 U	39 U	39 U	40 UJ	41 U
o,o,o-Triethylphosphorothioate	38 U	39 U	39 U	40 UJ	41 U
General Chemistry (milligram per kilogram)					
Total organic carbon	120 U	120 U	120 U	120 U	130 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-5-75	MR-SD-5-150	MR-SD-5-315	MR-SD-6-25 ^b	MR-SD-6-90
Date Collected	November 3, 2000				
Volatile Organic Compounds (micrograms per kilogram [µg/kg])					
Acetone	1,300 U	2,500 U	1,300 U	24 U	35 U
Benzene	45 J	58 J	260 U	9.0	0.72 J
Chlorobenzene	1,800	6,700	3,100	82	8.0
Chloroform	370 U	320 U	260 U	6.0 U	5.6 U
Ethylbenzene	370 U	320 U	260 U	6.0 U	5.6 U
Methylene chloride	370 U	320 U	260 U	6.1 U	5.6 U
Xylenes (total)	370 U	320 U	260 U	6.0 U	5.6 U
Semivolatile Organic Compounds (µg/kg)					
Aniline	2,400	3,400	380 U	400 U	400 U
bis(2-Ethylhexyl)phthalate	430 U	430 U	380 U	93 J	400 U
4-Chloroaniline	3,000 J	6,400 J	380 U	400 U	400 U
1,2-Dichlorobenzene	430 U	430 U	380 U	190 J	55 J
1,3-Dichlorobenzene	430 U	430 U	380 U	150 J	400 U
1,4-Dichlorobenzene	300 J	1,700	380 U	330 J	51 J
Organochlorine Pesticides (µg/kg)					
Aldrin	2.2 U	11 U	1.9 U	2.0 U	2.0 U
alpha-BHC	2.2 U	11 U	1.9 U	2.0 U	2.0 U
beta-BHC	2.2 U	11 U	1.9 U	2.0 U	2.0 U
delta-BHC	2.2 U	11 U	1.9 U	2.0 U	2.0 U
gamma-BHC (lindane)	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Chlordane (technical)	22 U	110 U	19 U	20 U	20 U
Chlorobenzilate	43 U	220 U	38 U	40 U	40 U
4,4-DDD	2.2 U	11 U	1.9 U	2.0 U	2.0 U
4,4-DDE	2.2 U	11 U	1.9 U	2.0 U	2.0 U
4,4-DDT	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Diallate	43 U	220 U	38 U	40 U	40 U
Dieldrin	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endosulfan I	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endosulfan II	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endosulfan sulfate	2.2 U	11 U	1.9 U	2.0 U	2.0 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-5-75	MR-SD-5-150	MR-SD-5-315	MR-SD-6-25 ^b	MR-SD-6-90
Date Collected	November 3, 2000				
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Endrin aldehyde	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Heptachlor	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Heptachlor epoxide	2.2 U	11 U	1.9 U	2.0 U	2.0 U
Isodrin	4.3 U	22 U	3.8 U	4.0 U	4.0 U
Kepone	43 U	220 U	38 U	40 U	40 U
Methoxychlor	4.3 U	22 U	3.8 U	4.0 U	4.0 U
Toxaphene	88 U	440 U	77 U	81 U	80 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	43 U	120 J	38 U	40 U	40 U
Aroclor 1221	43 U	43 U	38 U	40 U	40 U
Aroclor 1232	43 U	43 U	38 U	40 U	40 U
Aroclor 1242	43 U	43 U	38 U	40 U	40 U
Aroclor 1248	43 U	43 U	38 U	40 U	31 J
Aroclor 1254	43 U	43 U	38 U	40 U	40 U
Aroclor 1260	43 U	43 U	38 U	40 U	40 U
Organochlorine Herbicides (µg/kg)					
2,4-D	100 U	100 U	92 U	96 U	96 U
2,4,5-TP (Silvex)	26 U	26 U	23 U	24 U	24 U
2,4,5-T	26 U	26 U	23 U	24 U	24 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	43 U	43 U	38 U	40 U	40 U
Disulfoton	43 U	43 U	38 U	40 U	40 U
Famphur	43 U	43 U	38 U	40 U	40 U
Methyl parathion	43 U	43 U	38 U	40 U	40 U
Phorate	43 U	43 U	38 U	40 U	40 U
Tetraethylthiopyrophosphate	43 U	43 U	38 U	40 U	40 U
Thionazin	43 U	43 U	38 U	40 U	40 U
o,o,o-Triethylphosphorothioate	43 U	43 U	38 U	40 U	40 U
General Chemistry (milligram per kilogram)					
Total organic carbon	200	7,400	110 U	870	1,100

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-7-45	MR-SD-7-150	MR-SD-7-280	MR-SD-8-57	MR-SD-9-51
Date Collected	November 3, 2000			October 27, 2000	
Volatile Organic Compounds (micrograms per kilogram [$\mu\text{g}/\text{kg}$])					
Acetone	35 U	1,600 U	22 U	75 U	120 U
Benzene	5.7 U	36 J	5.5 U	6.0 U	6.8 U
Chlorobenzene	2.2 U	1,600	5.5 U	6.0 U	1.6 J
Chloroform	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Ethylbenzene	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Methylene chloride	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Xylenes (total)	5.7 U	270 U	5.5 U	6.0 U	6.8 U
Semivolatile Organic Compounds ($\mu\text{g}/\text{kg}$)					
Aniline	400 U	390 U	390 U	390 U	420 U
bis(2-Ethylhexyl)phthalate	400 U	390 U	390 U	390 U	420 U
4-Chloroaniline	400 U	58 J	390 U	390 U	420 U
1,2-Dichlorobenzene	400 U	390 U	390 U	390 U	420 U
1,3-Dichlorobenzene	400 U	390 U	390 U	390 U	420 U
1,4-Dichlorobenzene	400 U	390 U	390 U	390 U	420 U
Organochlorine Pesticides ($\mu\text{g}/\text{kg}$)					
Aldrin	2.1 U	2.0 U	2.0 U	2.0 U	11 U
alpha-BHC	2.1 U	2.0 U	2.0 U	2.0 U	11 U
beta-BHC	2.1 U	2.0 U	2.0 U	2.0 U	11 U
delta-BHC	2.1 U	2.0 U	2.0 U	2.0 U	11 U
gamma-BHC (lindane)	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Chlordane (technical)	21 U	20 U	20 U	20 U	110 U
Chlorobenzilate	40 U	39 U	39 U	39 U	210 U
4,4-DDD	2.1 U	2.0 U	2.0 U	2.0 U	11 U
4,4-DDE	2.1 U	2.0 U	2.0 U	2.0 U	11 U
4,4-DDT	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Diallate	40 U	39 U	39 U	39 U	210 U
Dieldrin	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endosulfan I	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endosulfan II	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endosulfan sulfate	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Endrin	2.1 U	2.0 U	2.0 U	2.0 U	11 U

TABLE 2 (Continued)**VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES**

Sample Identification	MR-SD-7-45	MR-SD-7-150	MR-SD-7-280	MR-SD-8-57	MR-SD-9-51
Date Collected	November 3, 2000			October 27, 2000	
Organochlorine Pesticides (µg/kg) (Continued)					
Endrin aldehyde	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Heptachlor	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Heptachlor epoxide	2.1 U	2.0 U	2.0 U	2.0 U	11 U
Isodrin	4.0 U	3.9 U	3.9 U	3.9 U	21 U
Kepone	40 U	39 U	39 U	39 U	210 U
Methoxychlor	4.0 U	3.9 U	3.9 U	3.9 U	21 U
Toxaphene	81 U	79 U	80 U	79 U	420 U
Polychlorinated Biphenyls (PCB) (µg/kg)					
Aroclor 1016	40 U	39 U	39 U	39 U	42 U
Aroclor 1221	40 U	39 U	39 U	39 U	42 U
Aroclor 1232	40 U	39 U	39 U	39 U	42 U
Aroclor 1242	40 U	39 U	39 U	39 U	42 U
Aroclor 1248	40 U	20 J	39 U	39 U	42 U
Aroclor 1254	40 U	39 U	39 U	39 U	42 U
Aroclor 1260	40 U	39 U	39 U	39 U	42 U
Organochlorine Herbicides (µg/kg)					
2,4-D	97 U	94 U	95 U	94 U	100 U
2,4,5-TP (Silvex)	24 U	24 U	24 U	24 U	25 U
2,4,5-T	24 U	24 U	24 U	24 U	25 U
Organophosphorus Pesticides (µg/kg)					
Dimethoate	40 U	39 U	39 U	39 U	42 U
Disulfoton	40 U	39 U	39 U	39 U	42 U
Famphur	40 U	39 U	39 U	39 U	42 U
Methyl parathion	40 U	39 U	39 U	39 U	42 U
Phorate	40 U	39 U	39 U	39 U	42 U
Tetraethylthiopyrophosphate	40 U	39 U	39 U	39 U	42 U
Thionazin	40 U	39 U	39 U	39 U	42 U
o,o,o-Triethylphosphorothioate	40 U	39 U	39 U	39 U	42 U
General Chemistry (milligram per kilogram)					
Total organic carbon	780	120 U	120 U	120 U	3,700

TABLE 2 (Continued)

VALIDATED ANALYTICAL RESULTS FOR SOLUTIA, INC. SEDIMENT SAMPLES

Notes:

J = The result was estimated for quality control reasons.
U = The analyte was not detected; the numerical value is the sample reporting limit.
UJ = The analyte was not detected; the sample reporting limit is estimated for quality control reasons.

- ^a Field duplicate of sample MR-SD-3-99.
^b Field duplicate of sample MR-SD-6-90.

ENCLOSURE 2

**PARTICLE SIZE ANALYSIS RESULTS
FOR SEDIMENT SAMPLES
COLLECTED OCTOBER 24 THROUGH NOVEMBER 3, 2000
SOLUTIA, INC.
SAUGET, ILLINOIS**

(35 Pages)

Particle Size of Soils by ASTM D422

Sample preparation by: **D2217**
 Client: Various Project No.: **20000** ETR(s) #: **80138,80507**
 Client Code: **BLABO2,STLNC** Job No.: **20000** SDG(s): **KAL273,80506**
 Date Received: **08-Nov-00** Start Date: **13-Nov-00** End Date: **20-Nov-00**

Lab ID: 436437

Sample ID: PDA-260

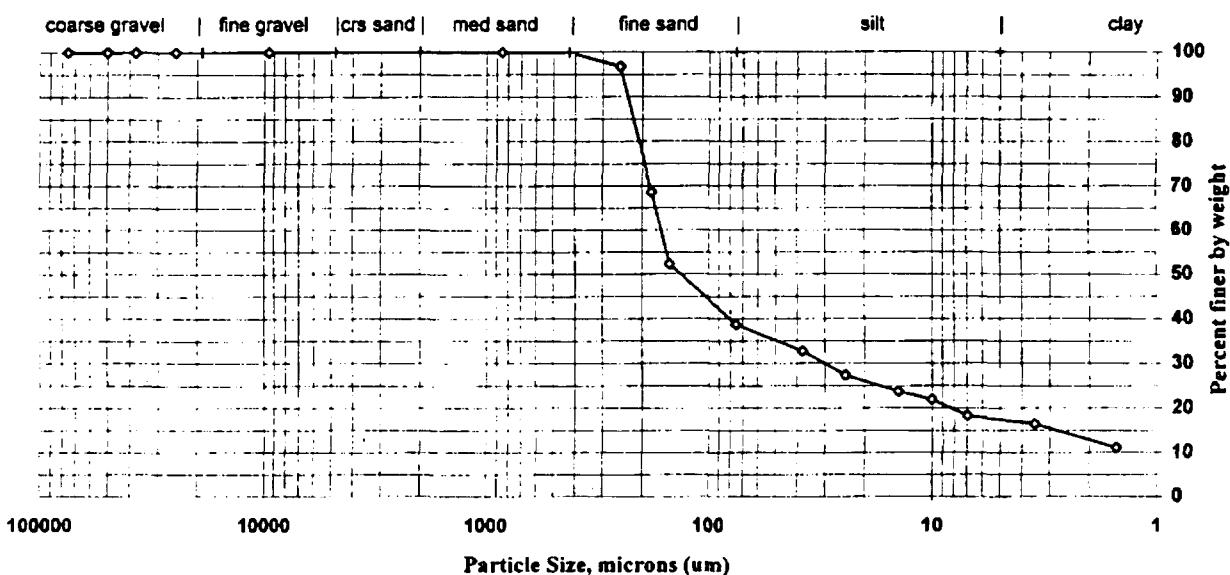
Percent Solids: **60.8%**

Maximum Particle Size: **Med sand**

Specific Gravity: **2.38**

Shape (> #10): **N/A**

Hardness (> #10): **N/A**



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	100.0	0.0
#40	425	100.0	0.0
#60	250	96.8	3.2
#80	180	68.6	28.1
#100	150	52.3	16.3
#200	75	38.7	13.6
Hydrometer	37.6	32.8	5.9
	24.2	27.4	5.4
	14.1	23.8	3.6
	10.0	22.0	1.8
	7.0	18.3	3.6
	3.5	16.5	1.8
V	1.5	11.1	5.4

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

0019
Date: 17/2/00

STL - Burlington 80138ps.xls::Report

Particle Size of Soils by ASTM D422

Sample preparation by: **D2217**

Client: STL North Canton	Project No.: 20000	ETR(s) #: 80506-07-16-61-18
Client Code: STLN C	Job No.: 20000	SDG(s): 80506
Date Received: 06-Nov-00	Start Date: 27-Nov-00	End Date: 28-Nov-00

Lab ID: 435981

Sample ID: PDA-5-R60

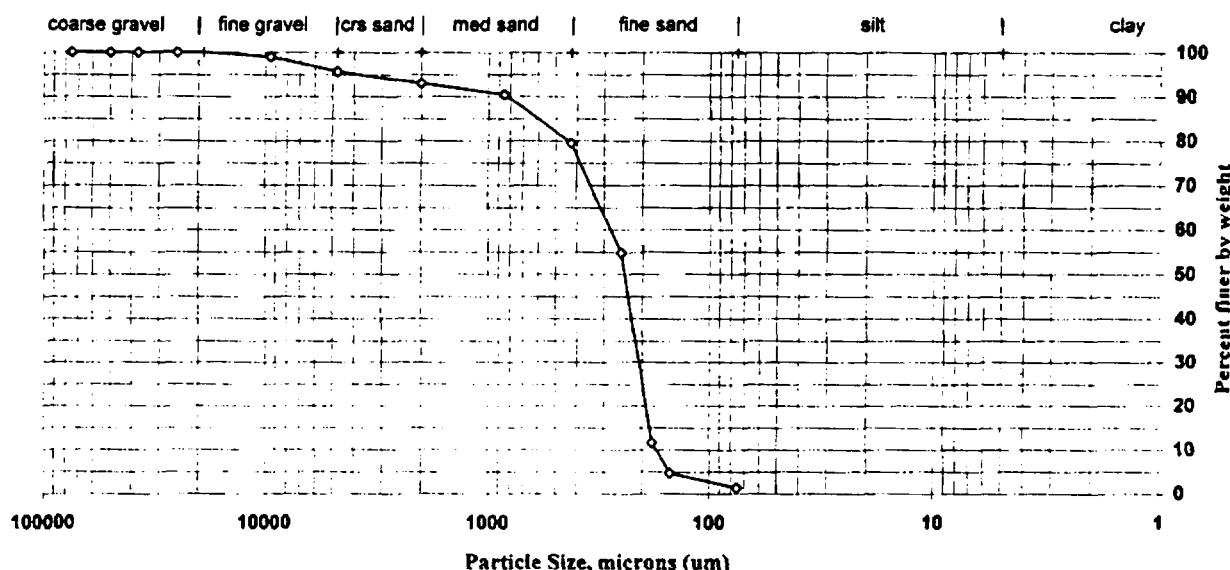
Percent Solids: 82.7%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	99.0	1.0
#4	4750	95.7	3.4
#10	2000	93.0	2.7
#20	850	90.5	2.5
#40	425	79.5	11.0
#60	250	54.8	24.7
#80	180	11.6	43.1
#100	150	4.7	6.9
#200	75	1.4	3.3
Hydrometer	0.0	0.0	1.4
I	0.0	0.0	0.0
I	0.0	0.0	0.0
I	0.0	0.0	0.0
I	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: J. H. M. Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436440	Sample ID: MR-SD-857
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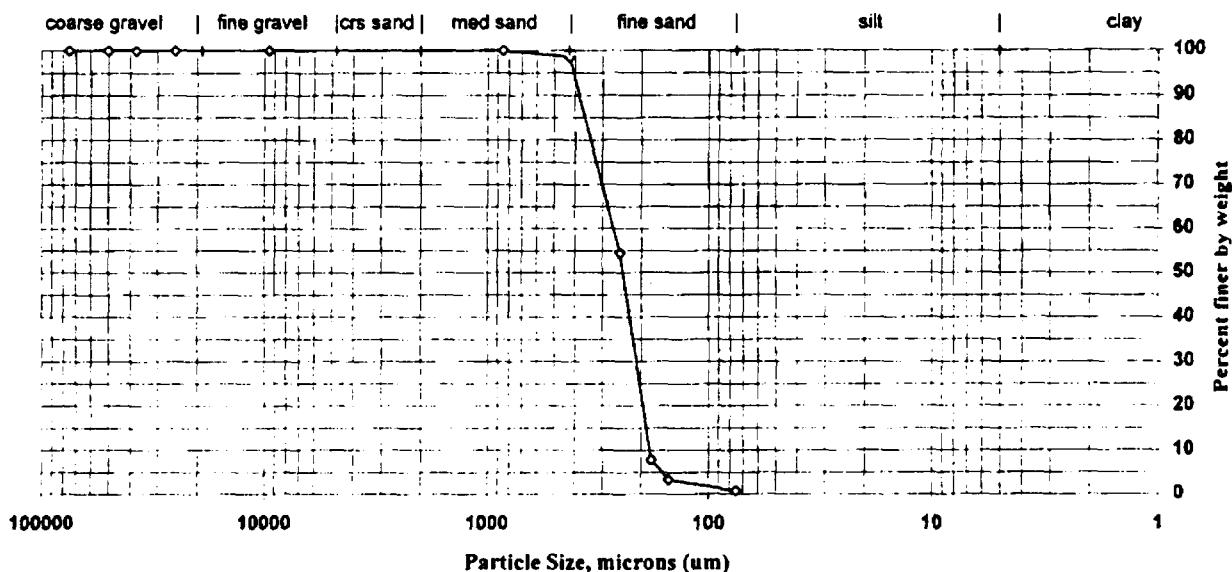
Percent Solids: 83.7%

Maximum Particle Size: Med sand

Specific Gravity: 2.65

Shape (> #10): N/A

Hardness (> #10): N/A



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	100.0	0.0
#40	425	98.5	1.5
#60	250	54.4	44.1
#80	180	7.8	46.6
#100	150	3.3	4.5
#200	75	0.8	2.5
Hydrometer	0.0	0.0	0.8
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

Client: STL North Canton	Project No.: 20000	ETR(s) #: 80506-07-16-61-18
Client Code: STLNC	Job No.: 20000	SDG(s): 80506
Date Received: 06-Nov-00	Start Date: 27-Nov-00	End Date: 28-Nov-00

Lab ID: 436481

Sample ID: MR-SD-2-150

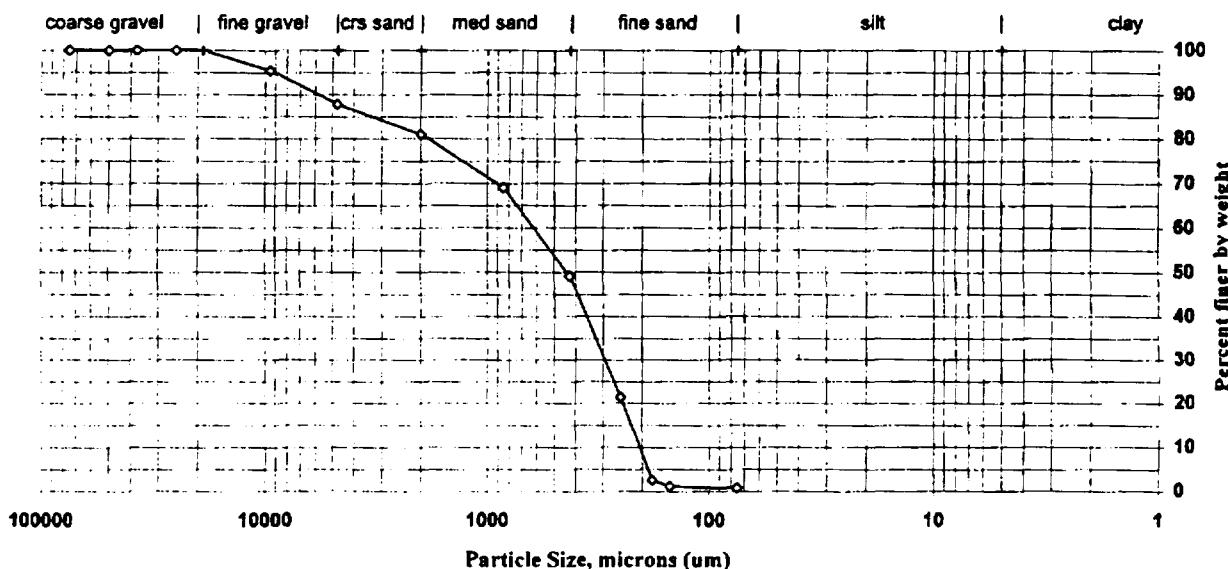
Percent Solids: 86.3%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	95.5	4.5
#4	4750	87.8	7.6
#10	2000	81.1	6.8
#20	850	69.1	12.0
#40	425	49.2	19.9
#60	250	21.4	27.7
#80	180	2.6	18.9
#100	150	1.2	1.4
#200	75	0.8	0.4
Hydrometer	0.0	0.0	0.8
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

[Signature]

0020-6
Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436483

Sample ID: MR-SD-I-50

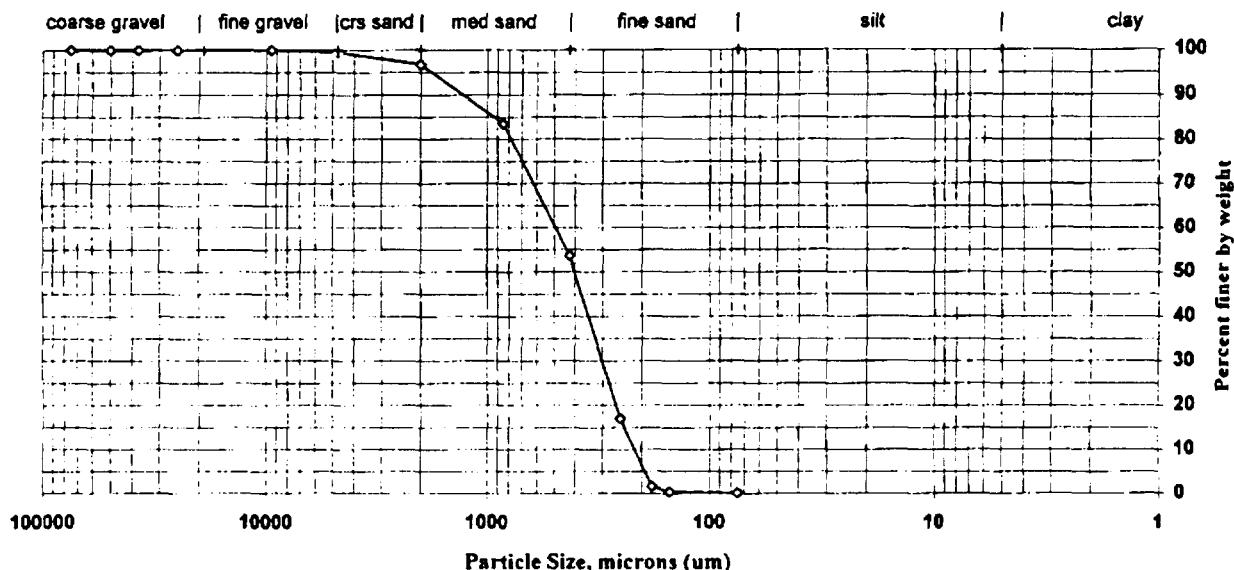
Percent Solids: 84.3%

Maximum Particle Size: 9.5 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.6	0.4
#10	2000	96.8	2.8
#20	850	83.5	13.3
#40	425	53.6	29.9
#60	250	17.0	36.6
#80	180	1.5	15.5
#100	150	0.3	1.2
#200	75	0.1	0.2
Hydrometer	0.0	0.0	0.1
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

Client: <u>STL North Canton</u>	Project No.: <u>20000</u>	ETR(s) #: <u>80506-07-16-61-18</u>
Client Code: <u>STLN</u>	Job No.: <u>20000</u>	SDG(s): <u>80506</u>
Date Received: <u>06-Nov-00</u>	Start Date: <u>27-Nov-00</u>	End Date: <u>28-Nov-00</u>

Lab ID: 436488

Sample ID: MR-SD-3-25

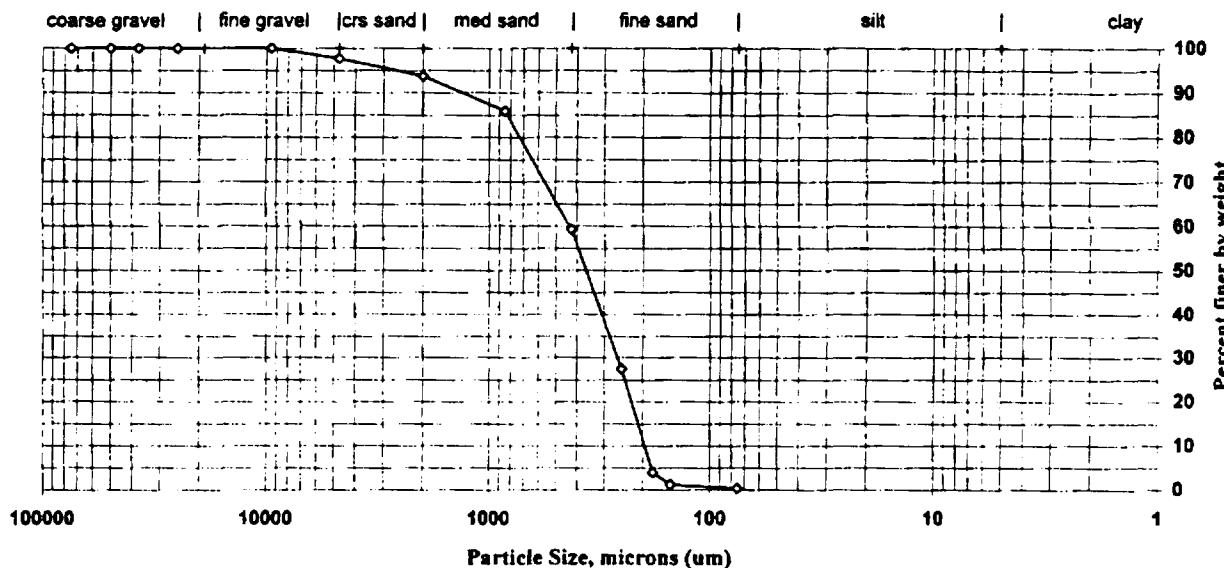
Percent Solids: 85.0%

Maximum Particle Size: 9.5 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	97.7	2.3
#10	2000	93.7	4.0
#20	850	86.0	7.8
#40	425	59.3	26.7
#60	250	27.5	31.8
#80	180	3.9	23.6
#100	150	1.3	2.7
#200	75	0.4	0.8
Hydrometer	0.0	0.0	0.4
I	0.0	0.0	0.0
I	0.0	0.0	0.0
I	0.0	0.0	0.0
I	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80518
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 07-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436490

Sample ID: MR-SD-4-90

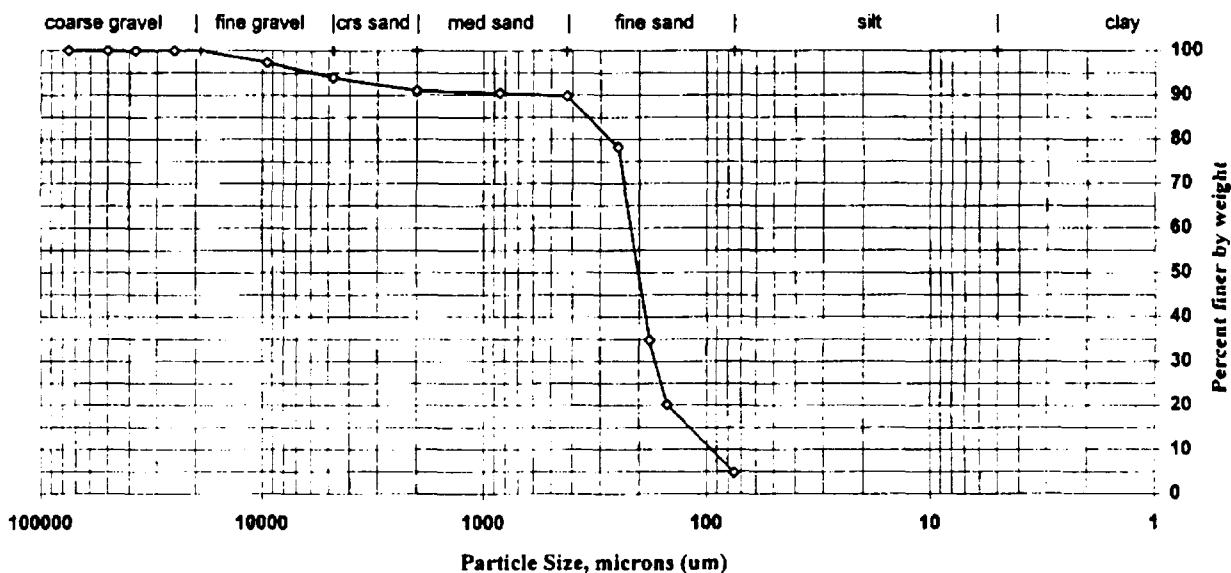
Percent Solids: 84.0%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	97.3	2.7
#4	4750	93.9	3.4
#10	2000	91.0	2.9
#20	850	90.4	0.6
#40	425	89.8	0.7
#60	250	78.2	11.6
#80	180	34.7	43.4
#100	150	20.2	14.5
#200	75	4.8	15.4
Hydrometer	0.0	0.0	4.8
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80518so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

Client: STL North Canton	Project No.: 20000	ETR(s) #: 80518
Client Code: STLNC	Job No.: 20000	SDG(s): 80506
Date Received: 07-Nov-00	Start Date: 27-Nov-00	End Date: 28-Nov-00

Lab ID: 436491

Sample ID: MR-SD-Pop-90

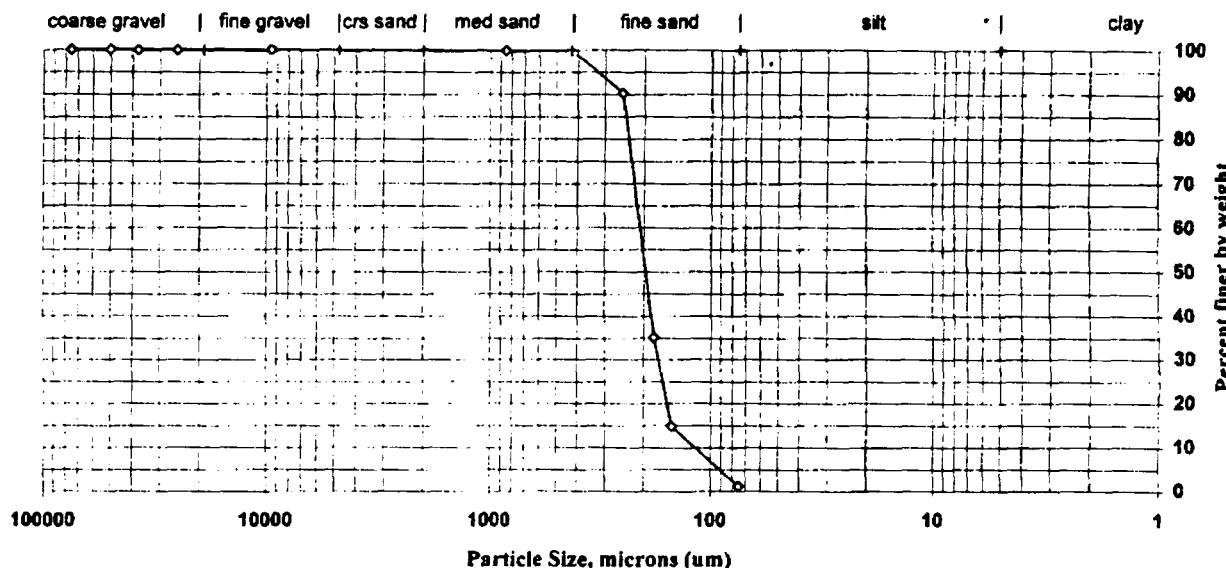
Percent Solids: 81.5%

Maximum Particle Size: Crs sand

Specific Gravity: 2.65

Shape (> #10): Subangular

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.9	0.1
#20	850	99.9	0.1
#40	425	99.8	0.1
#60	250	90.3	9.5
#80	180	35.2	55.1
#100	150	14.9	20.3
#200	75	1.3	13.6
Hydrometer	0.0	0.0	1.3
-	0.0	0.0	0.0
-	0.0	0.0	0.0
-	0.0	0.0	0.0
-	0.0	0.0	0.0
v	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: D. R. J.

Date: 12/1/00

STL - Burlington 80518so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436896	Sample ID: MR-SD-6-90
----------------	-----------------------

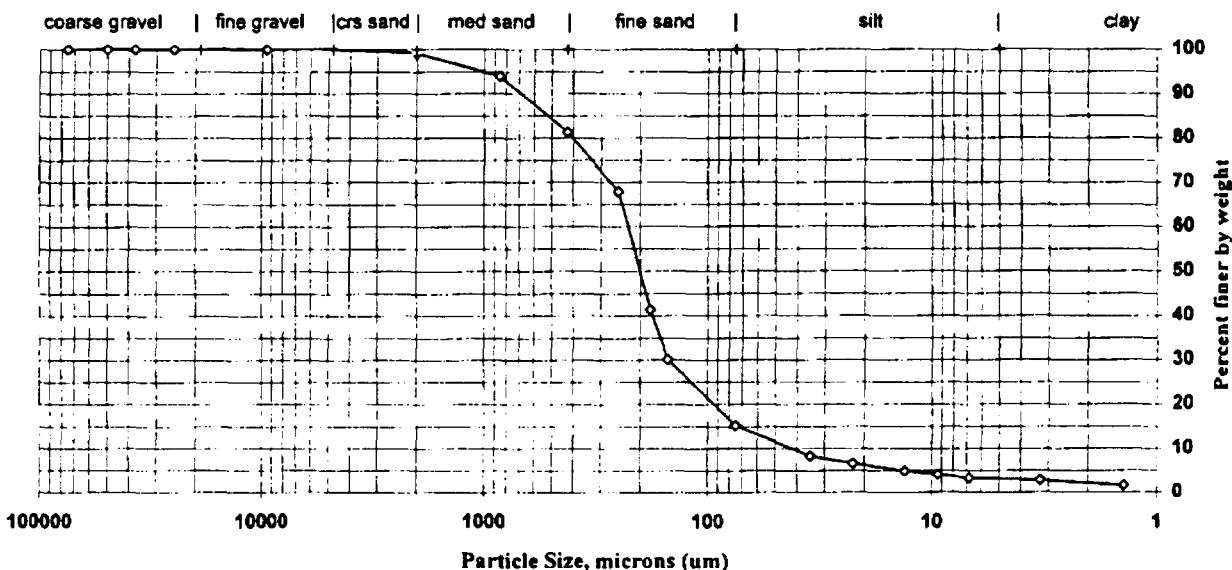
Percent Solids: 80.2%

Maximum Particle Size: Crs sand

Specific Gravity: 2.65

Shape (> #10): Rounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.2	0.8
#20	850	93.9	5.2
#40	425	81.3	12.6
#60	250	67.9	13.5
#80	180	41.5	26.4
#100	150	30.1	11.3
#200	75	15.2	14.9
Hydrometer	34.7	8.3	6.9
	22.4	6.6	1.7
	13.2	4.9	1.7
	9.4	4.2	0.8
	6.8	3.3	0.8
	3.3	2.8	0.5
V	1.4	1.6	1.2

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: JL

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

Sample preparation by: **D2217**

Client: STL North Canton

Project No.: 20000

ETR(s) #: 80561

Client Code: STLN.C

Job No.: 20000

SDG(s): 80506

Date Received: 09-Nov-00

Start Date: 28-Nov-00

End Date: 01-Dec-00

Lab ID: 436899

Sample ID: MR-SD-5-150

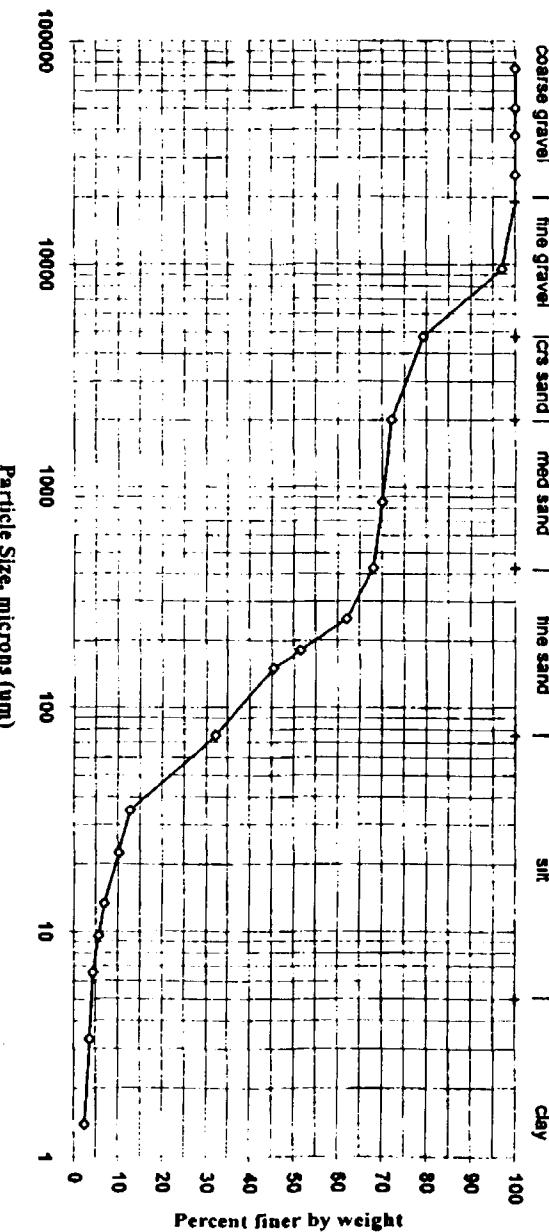
Percent Solids: 71.6%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Rounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	96.9	3.1
#4	4750	79.3	17.6
#10	2000	72.2	7.1
#20	850	70.0	2.2
#40	425	68.1	2.0
#60	250	62.1	5.9
#80	180	51.5	10.6
#100	150	45.4	6.1
#200	75	32.2	13.2
Hydrometer	34.7	12.7	19.5

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
1.25 ml sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436902

Sample ID: MR-SD-7-45

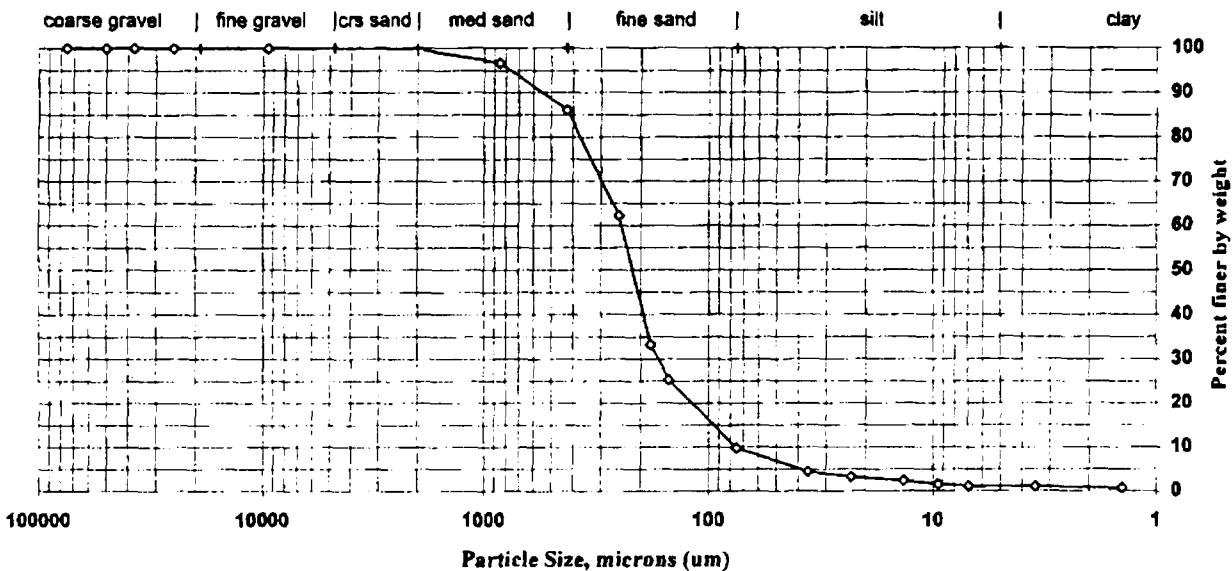
Percent Solids: 83.3%

Maximum Particle Size: Crs sand

Specific Gravity: 2.65

Shape (> #10): Rounded

Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.8	0.2
#20	850	96.7	3.2
#40	425	86.1	10.6
#60	250	62.3	23.8
#80	180	33.2	29.0
#100	150	25.3	7.9
#200	75	9.8	15.5
Hydrometer	36.1	4.4	5.4
1	23.1	3.2	1.2
1	13.5	2.4	0.8
1	9.5	1.6	0.8
1	6.9	1.2	0.4
1	3.5	1.1	0.1
V	1.4	0.7	0.4

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

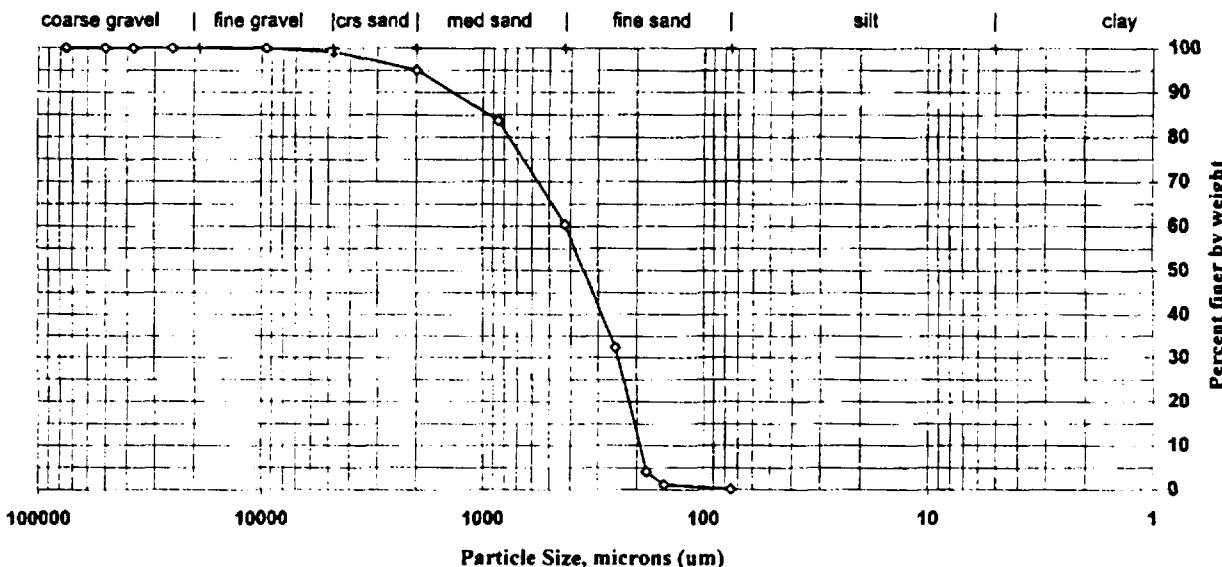
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLN C Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436901

Sample ID: MR-SD-7-280

Percent Solids: 86.1%
Specific Gravity: 2.65

Maximum Particle Size: 9.5 mm
Shape (> #10): Subrounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.2	0.8
#10	2000	95.0	4.2
#20	850	83.7	11.4
#40	425	60.5	23.2
#60	250	32.3	28.1
#80	180	4.1	28.3
#100	150	1.2	2.9
#200	75	0.1	1.1
Hydrometer	0.0	0.0	0.1
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

[Signature]

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

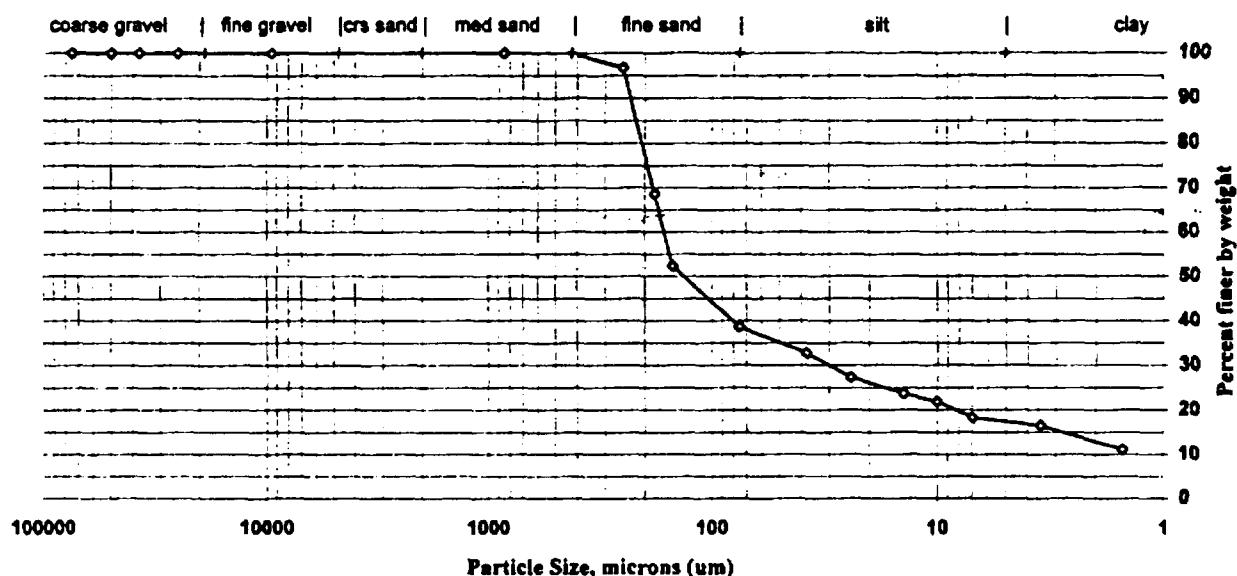
Sample preparation by: D2217
 Client: Various Project No.: 20000 ETR(s) #: 80138,80507
 Client Code: BLABO2,STLNC Job No.: 20000 SDG(s): KAL273,80506
 Date Received: 08-Nov-00 Start Date: 13-Nov-00 End Date: 20-Nov-00

Lab ID: 436437

Sample ID: PDA-260

Percent Solids: 60.8%
Specific Gravity: 2.38

Maximum Particle Size: Med sand
Shape (> #10): N/A
Hardness (> #10): N/A



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	100.0	0.0
#40	425	100.0	0.0
#60	250	96.8	3.2
#80	180	68.6	28.1
#100	150	52.3	16.3
#200	75	38.7	13.6
Hydrometer	37.6	32.8	5.9
1	24.2	27.4	5.4
1	14.1	23.8	3.6
1	10.0	22.0	1.8
1	7.0	18.3	3.6
1	3.5	16.5	1.8
V	1.5	11.1	5.4

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 11/22/00

STL - Burlington 80138ps.xls::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

Client: Various	Project No.: 20000	ETR(s) #: 80138,80507
Client Code: BLABO2,STLNC	Job No.: 20000	SDG(s): KAL273,80506
Date Received: 08-Nov-00	Start Date: 13-Nov-00	End Date: 20-Nov-00

Lab ID: 436439

Sample ID: MR-SD-951

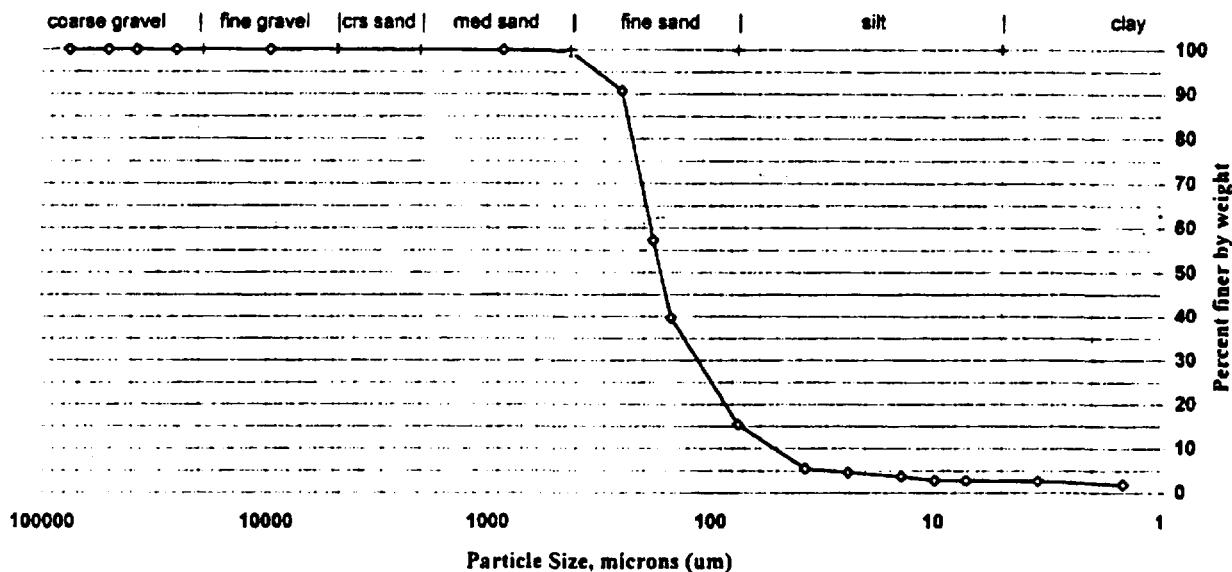
Percent Solids: 81.5%

Specific Gravity: 2.55

Maximum Particle Size: Crs sand

Shape (> #10): Subangular

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	99.9	0.0
#40	425	99.6	0.3
#60	250	90.7	8.9
#80	180	57.3	33.5
#100	150	39.7	17.5
#200	75	15.4	24.3
Hydrometer	37.6	5.6	9.9
	23.9	4.7	0.9
	13.9	3.8	0.9
	9.8	2.9	0.9
	7.1	2.9	0.0
	3.5	2.7	0.2
V	1.5	2.0	0.8

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 11/22/00

STL - Burlington 80138ps.xls::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 435981

Sample ID: PDA-5-R60

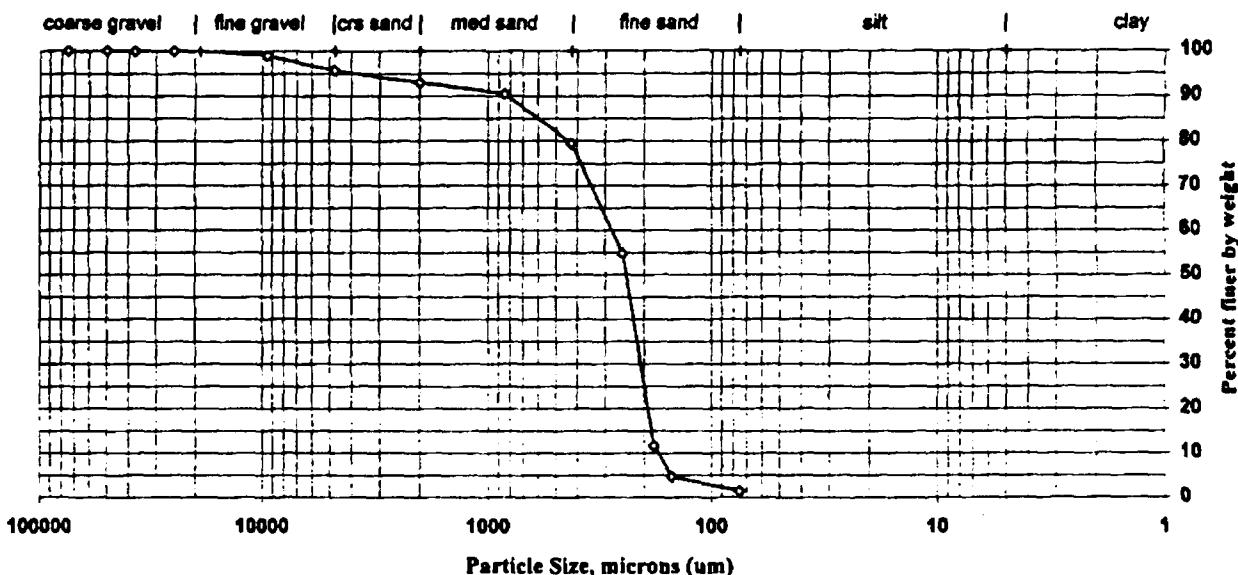
Percent Solids: 82.7%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	99.0	1.0
#4	4750	95.7	3.4
#10	2000	93.0	2.7
#20	850	90.5	2.5
#40	425	79.5	11.0
#60	250	54.8	24.7
#80	180	11.6	43.1
#100	150	4.7	6.9
#200	75	1.4	3.3
Hydrometer	0.0	0.0	1.4
+	0.0	0.0	0.0
-	0.0	0.0	0.0
/	0.0	0.0	0.0
\	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

[Signature]

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

Client: STL North Canton	Project No.: 20000	ETR(s) #: 80506-07-16-61-18
Client Code: STLN	Job No.: 20000	SDG(s): 80506
Date Received: 06-Nov-00	Start Date: 27-Nov-00	End Date: 28-Nov-00

Lab ID: 436438

Sample ID: PDA-860

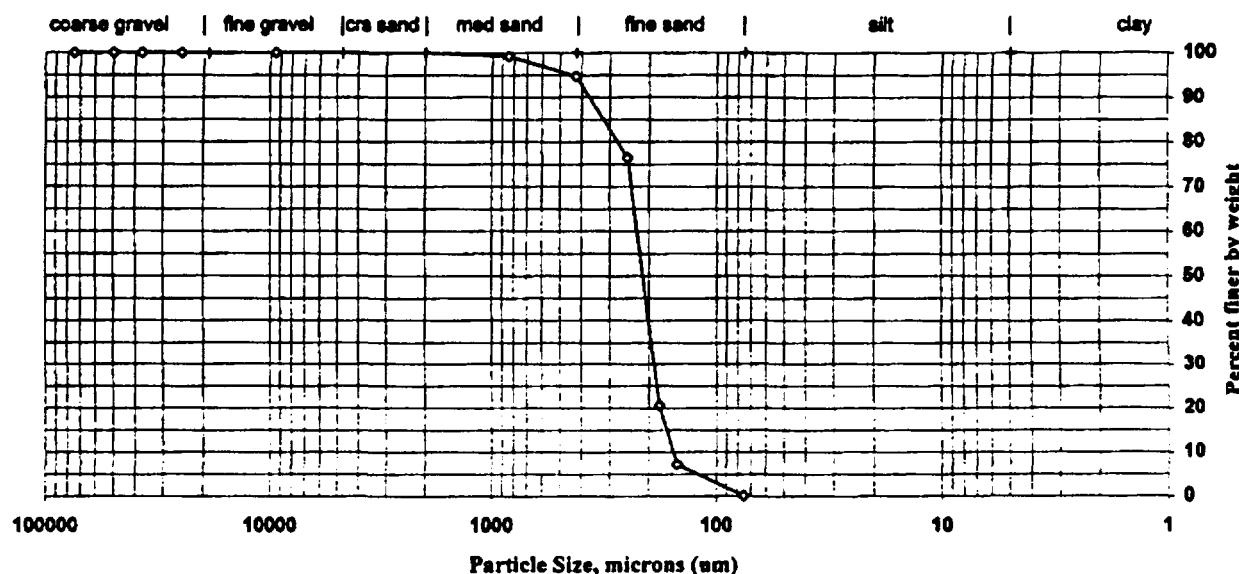
Percent Solids: 91.3%

Specific Gravity: 2.65

Maximum Particle Size: Crs sand

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	99.2	0.7
#40	425	94.7	4.5
#60	250	76.4	18.3
#80	180	20.6	55.8
#100	150	7.2	13.4
#200	75	0.2	7.1
Hydrometer	0.0	0.0	0.2
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436440

Sample ID: MR-SD-857

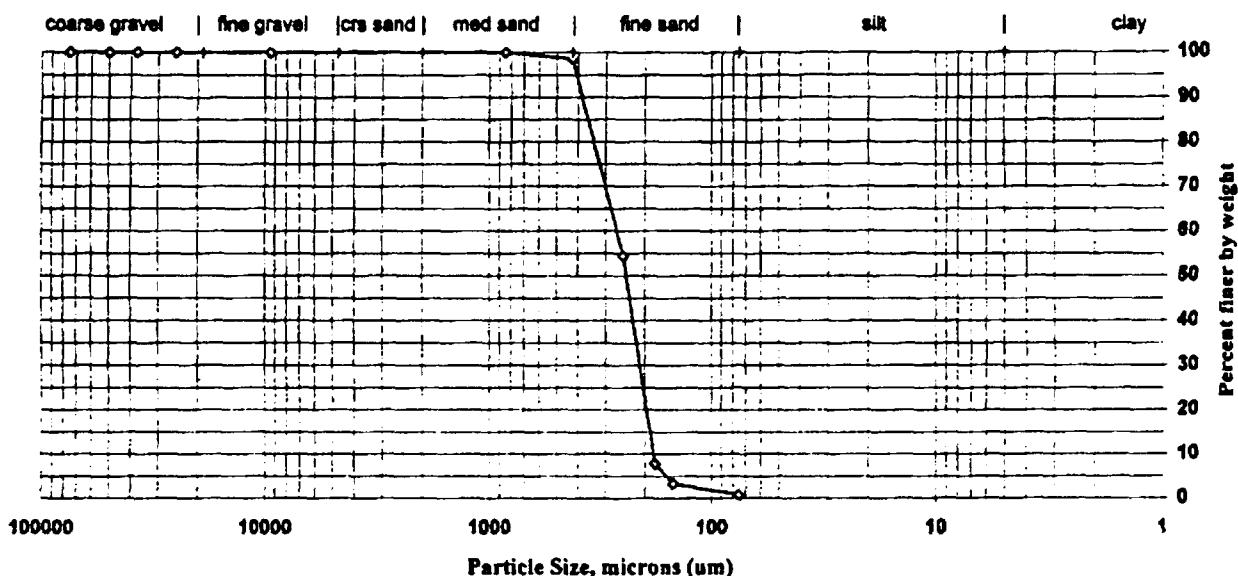
Percent Solids: 83.7%

Maximum Particle Size: Med sand

Specific Gravity: 2.65

Shape (> #10): N/A

Hardness (> #10): N/A



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	100.0	0.0
#40	425	98.5	1.5
#60	250	54.4	44.1
#80	180	7.8	46.6
#100	150	3.3	4.5
#200	75	0.8	2.5
Hydrometer	0.0	0.0	0.8
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle.
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLN C Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436480

Sample ID: MR-SD-2-50

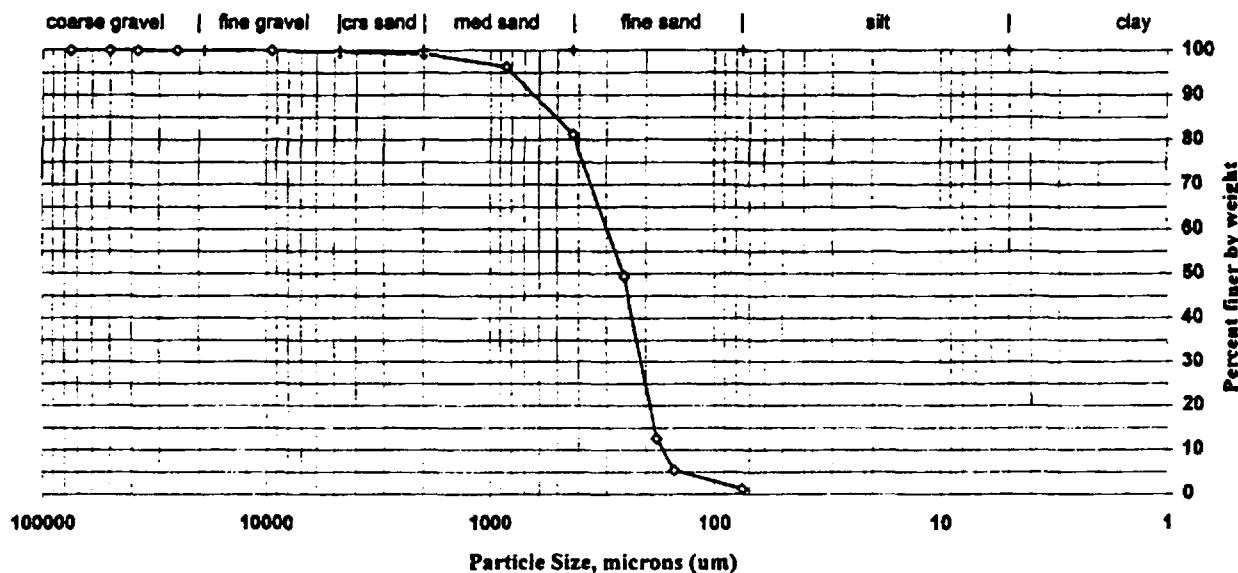
Percent Solids: 81.7%

Maximum Particle Size: 9.5 mm

Specific Gravity: 2.65

Shape (> #10): Subangular

Hardness (> #10): Brittle



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.6	0.4
#10	2000	99.2	0.4
#20	850	96.2	3.0
#40	425	81.2	15.1
#60	250	49.4	31.8
#80	180	12.6	36.8
#100	150	5.4	7.2
#200	75	1.2	4.2
Hydrometer	0.0	0.0	1.2
1	0.0	0.0	0.0
1	0.0	0.0	0.0
1	0.0	0.0	0.0
1	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: STL North Canton

Date: 12/4/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436481

Sample ID: MR-SD-2-150

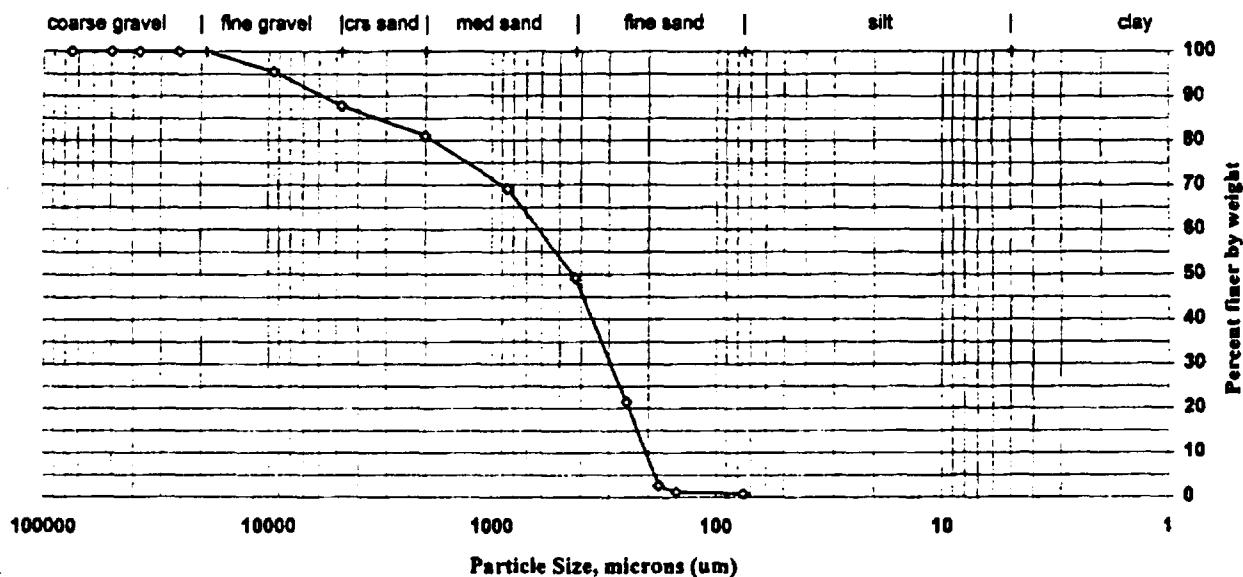
Percent Solids: 86.3%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	95.5	4.5
#4	4750	87.8	7.6
#10	2000	81.1	6.8
#20	850	69.1	12.0
#40	425	49.2	19.9
#60	250	21.4	27.7
#80	180	2.6	18.9
#100	150	1.2	1.4
#200	75	0.8	0.4
Hydrometer	0.0	0.0	0.8
/	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 ml sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

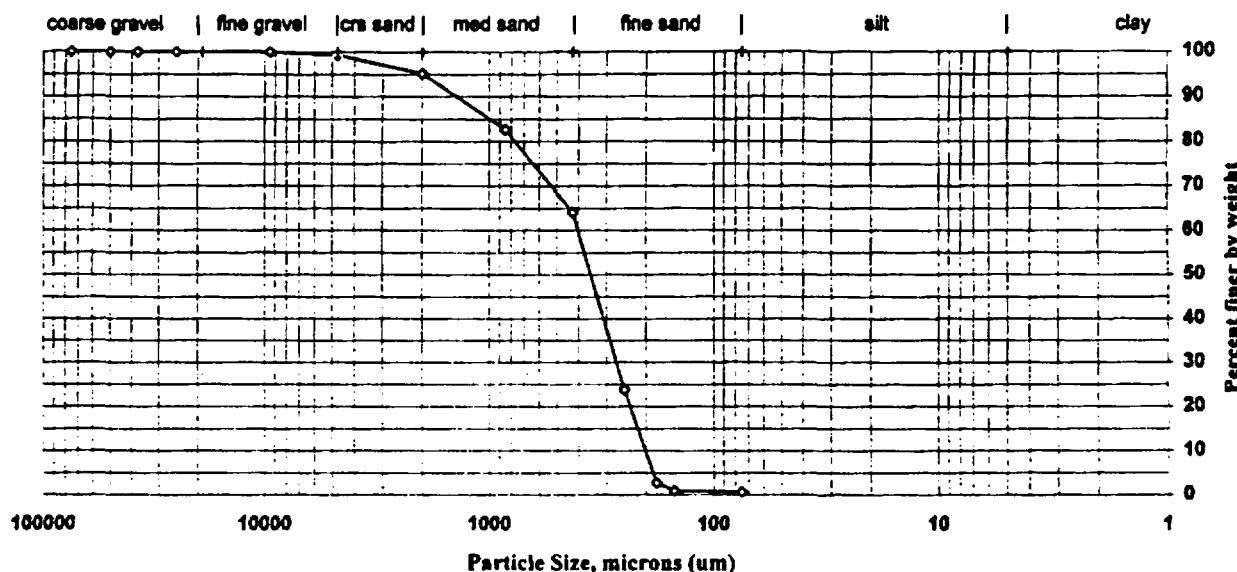
Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLN C Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436482

Sample ID: MR-SD-2-330

Percent Solids: 86.3%
 Specific Gravity: 2.65

Maximum Particle Size: 9.5 mm
 Shape (> #10): Subrounded
 Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.3	0.7
#10	2000	95.2	4.1
#20	850	82.7	12.5
#40	425	64.1	18.6
#60	250	23.8	40.3
#80	180	2.7	21.1
#100	150	0.9	1.8
#200	75	0.6	0.3
Hydrometer	0.0	0.0	0.6
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
 for hydrometer test
 by mechanical mixer
 with metal paddle,
 operated for at least
 one minute within a
 dispersion cup with
 125 mls sodium
 hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

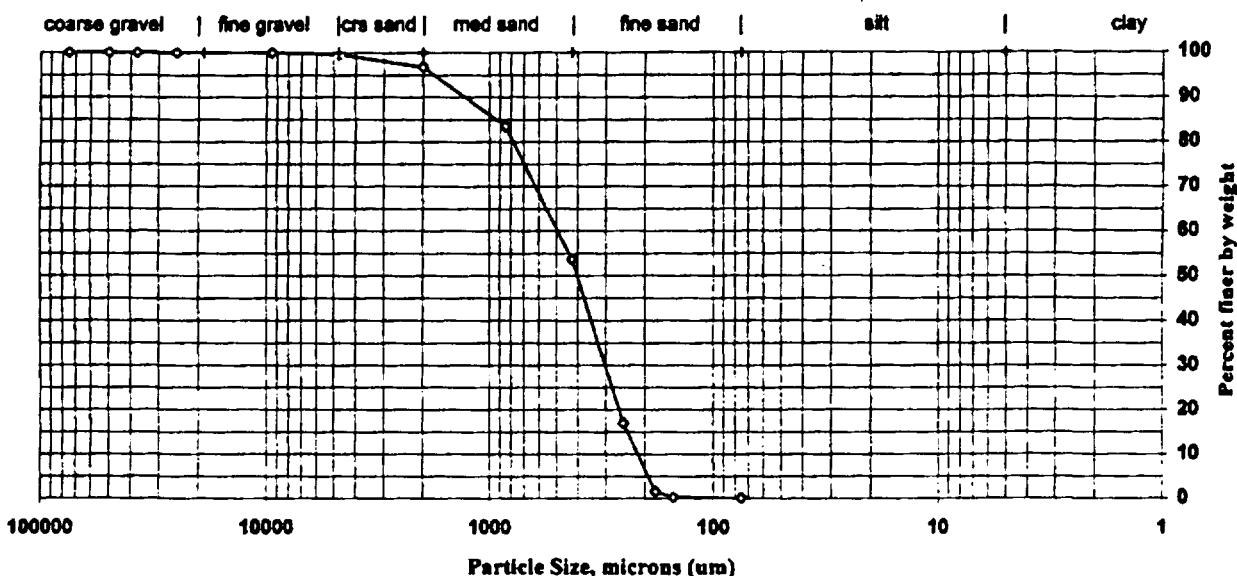
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436483

Sample ID: MR-SD-1-50

Percent Solids: 84.3%
Specific Gravity: 2.65

Maximum Particle Size: 9.5 mm
Shape (> #10): Subrounded
Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.6	0.4
#10	2000	96.8	2.8
#20	850	83.5	13.3
#40	425	53.6	29.9
#60	250	17.0	36.6
#80	180	1.5	15.5
#100	150	0.3	1.2
#200	75	0.1	0.2
Hydrometer	0.0	0.0	0.1
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

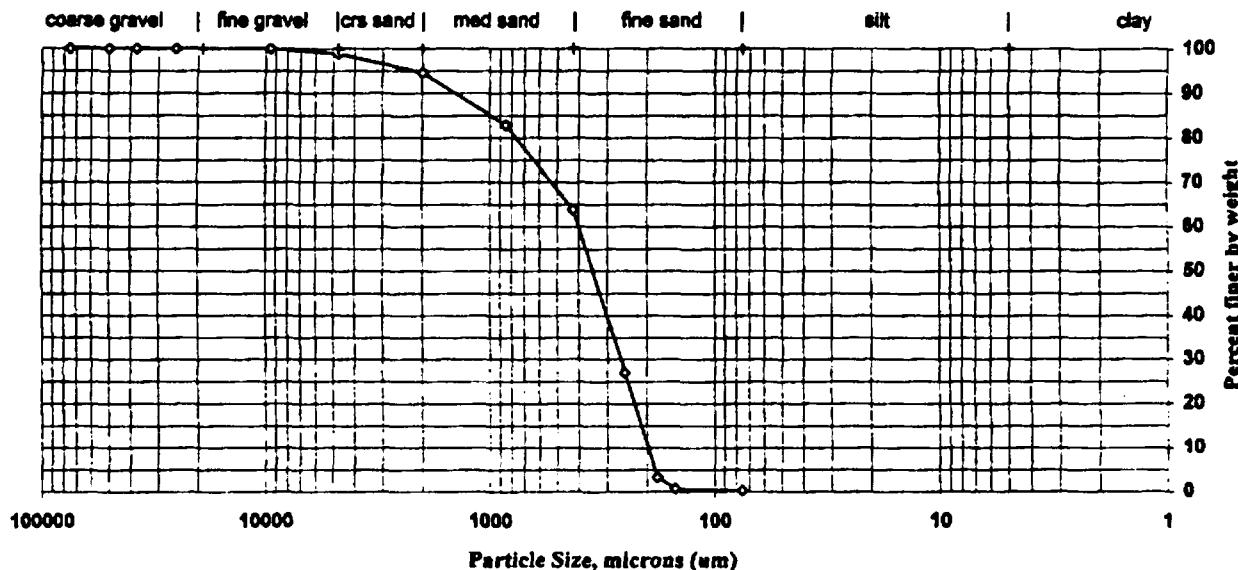
Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: <u>436484</u>	Sample ID: <u>MR-SD-1-300</u>
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Percent Solids: 83.6%
Specific Gravity: 2.65

Maximum Particle Size: 9.5 mm
Shape (> #10): Subrounded
Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	98.9	1.1
#10	2000	94.6	4.3
#20	850	82.9	11.7
#40	425	63.9	19.0
#60	250	27.0	36.9
#80	180	3.4	23.6
#100	150	0.8	2.6
#200	75	0.3	0.4
Hydrometer	0.0	0.0	0.3
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: DS/JS/2

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436488

Sample ID: MR-SD-3-25

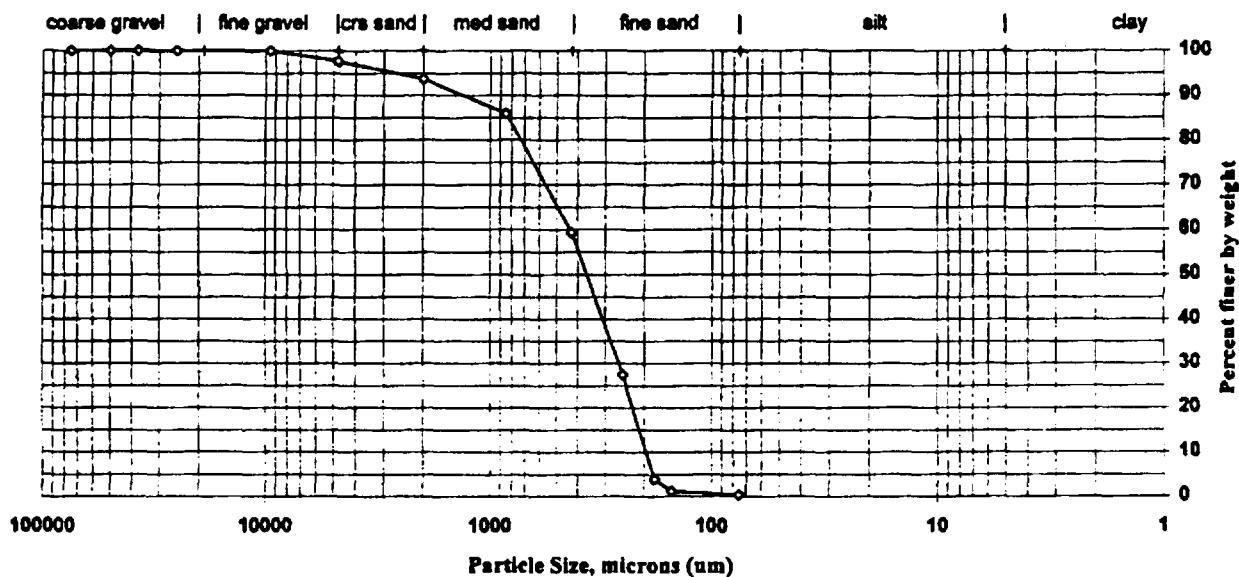
Percent Solids: 85.0%

Maximum Particle Size: 9.5 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	97.7	2.3
#10	2000	93.7	4.0
#20	850	86.0	7.8
#40	425	59.3	26.7
#60	250	27.5	31.8
#80	180	3.9	23.6
#100	150	1.3	2.7
#200	75	0.4	0.8
Hydrometer	0.0	0.0	0.4
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle.
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436489	Sample ID: MR-SD-3-99
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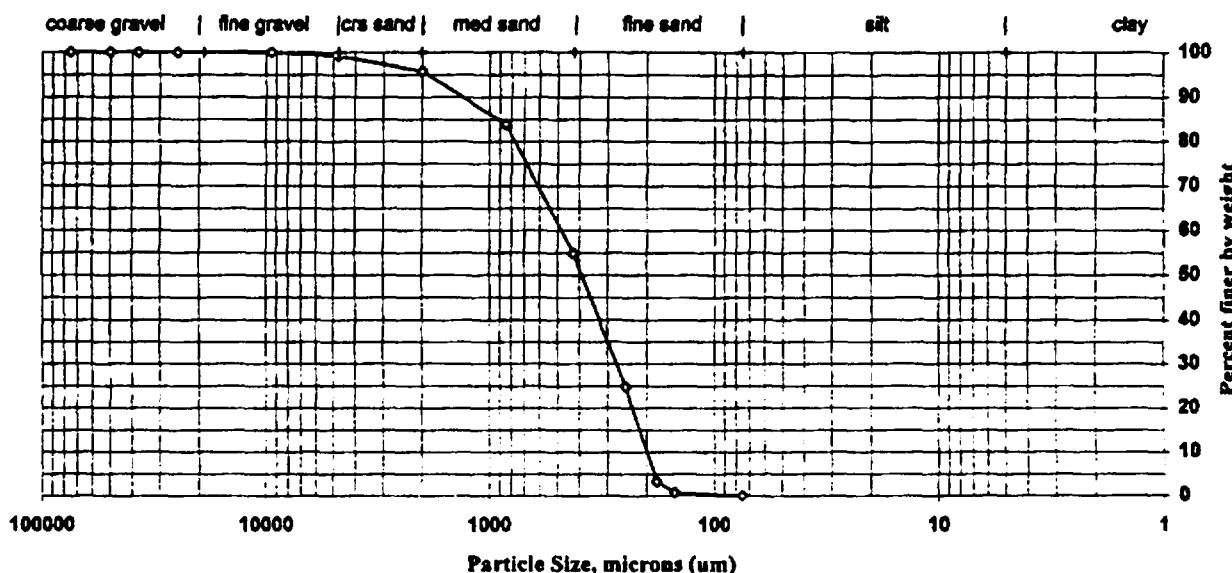
Percent Solids: 86.5%

Maximum Particle Size: 9.5 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.1	0.9
#10	2000	95.7	3.4
#20	850	84.0	11.8
#40	425	54.8	29.1
#60	250	24.9	30.0
#80	180	3.3	21.6
#100	150	0.8	2.5
#200	75	0.0	0.7
Hydrometer	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80518
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 07-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436490

Sample ID: MR-SD-4-90

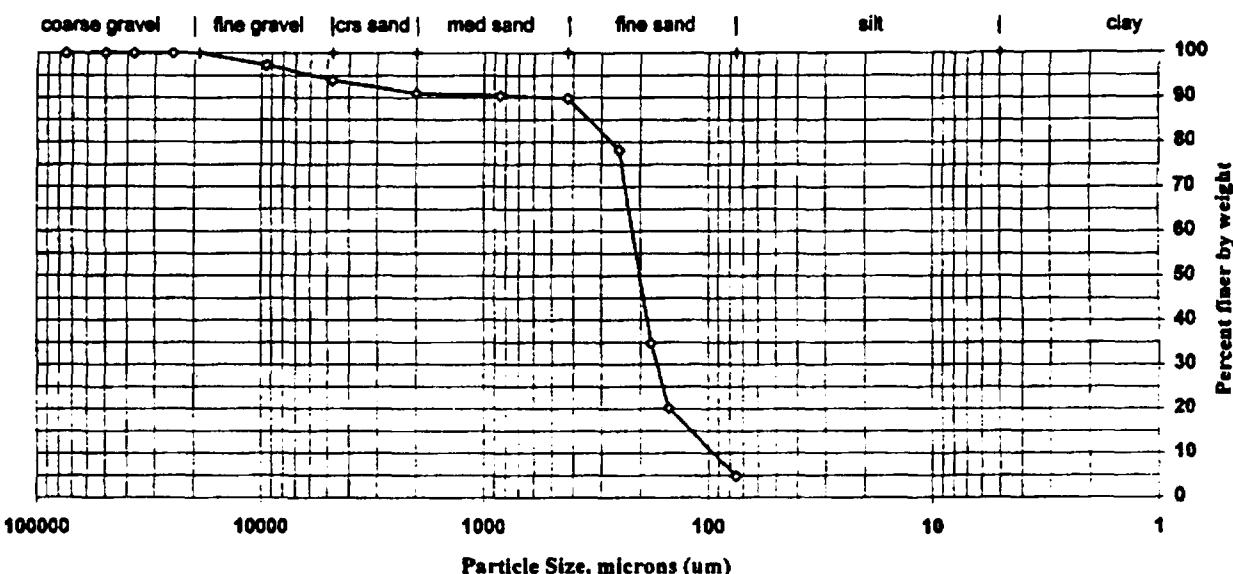
Percent Solids: 84.0%

Maximum Particle Size: 19 mm

Specific Gravity: 2.65

Shape (> #10): Subrounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	97.3	2.7
#4	4750	93.9	3.4
#10	2000	91.0	2.9
#20	850	90.4	0.6
#40	425	89.8	0.7
#60	250	78.2	11.6
#80	180	34.7	43.4
#100	150	20.2	14.5
#200	75	4.8	15.4
Hydrometer	0.0	0.0	4.8
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle.
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80518so::Report

Particle Size of Soils by ASTM D422

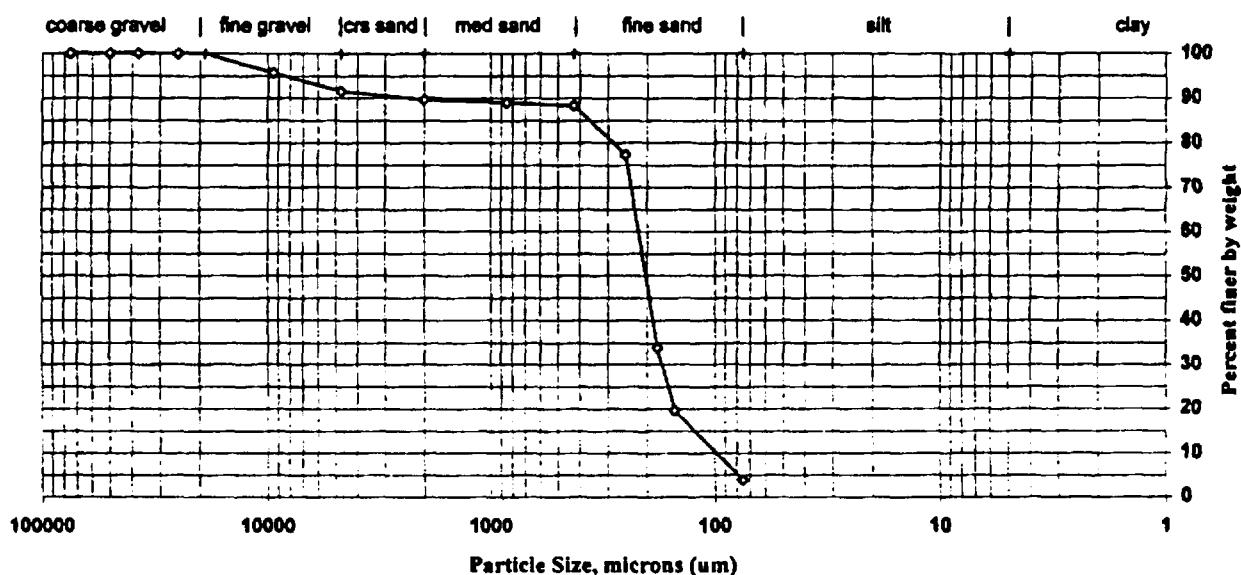
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80518
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 07-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436490DP

Sample ID: MR-SD-90REP

Percent Solids: 82.8%
Specific Gravity: 2.65

Maximum Particle Size: 19 mm
Shape (> #10): Subrounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	95.7	4.3
#4	4750	91.6	4.1
#10	2000	89.7	1.9
#20	850	89.0	0.7
#40	425	88.4	0.6
#60	250	77.3	11.0
#80	180	34.0	43.4
#100	150	19.6	14.4
#200	75	3.8	15.8
Hydrometer	0.0	0.0	3.8
1	0.0	0.0	0.0
1	0.0	0.0	0.0
1	0.0	0.0	0.0
1	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80518so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80518
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 07-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436491

Sample ID: MR-SD-Pop-90

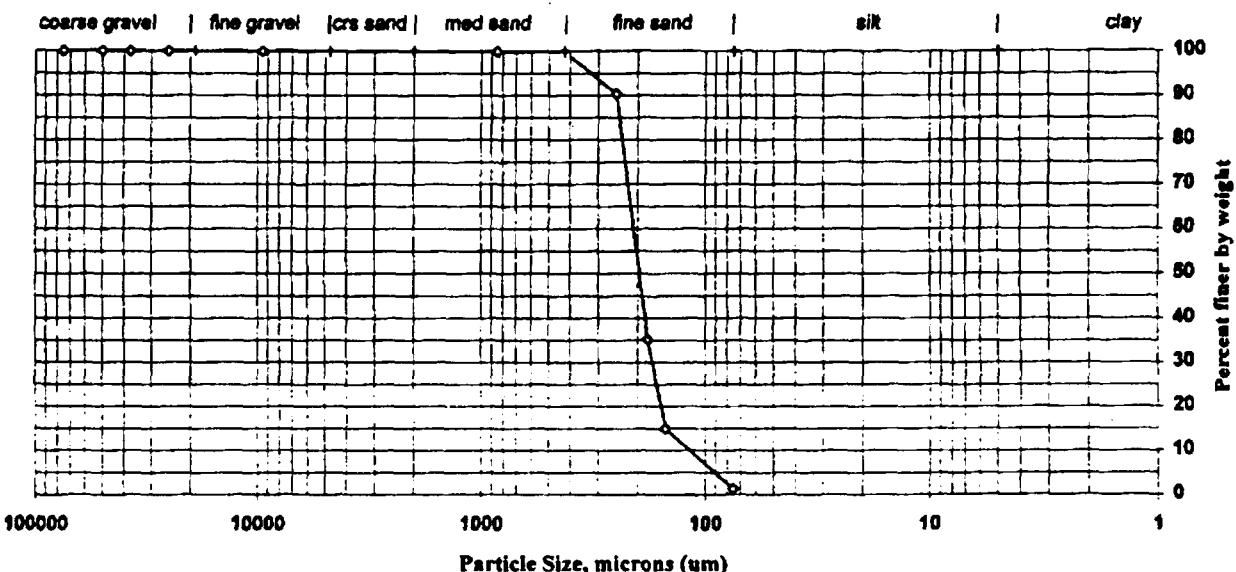
Percent Solids: 81.5%

Specific Gravity: 2.65

Maximum Particle Size: Crs sand

Shape (> #10): Subangular

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.9	0.1
#20	850	99.9	0.1
#40	425	99.8	0.1
#60	250	90.3	9.5
#80	180	35.2	55.1
#100	150	14.9	20.3
#200	75	1.3	13.6
Hydrometer	0.0	0.0	1.3
1	0.0	0.0	0.0
1	0.0	0.0	0.0
1	0.0	0.0	0.0
1	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80518so::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217

Client: <u>STL North Canton</u>	Project No.: <u>20000</u>	ETR(s) #: <u>80561</u>
Client Code: <u>STLN</u>	Job No.: <u>20000</u>	SDG(s): <u>80506</u>
Date Received: <u>09-Nov-00</u>	Start Date: <u>28-Nov-00</u>	End Date: <u>01-Dec-00</u>

Lab ID: 436895

Sample ID: MR-SD-6-25

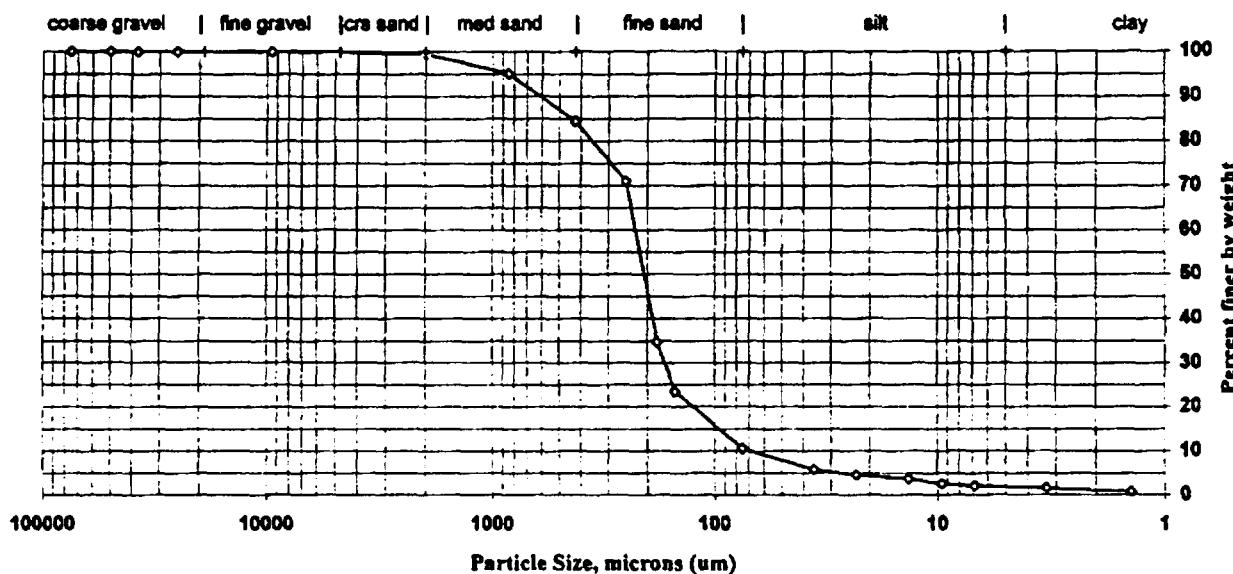
Percent Solids: 80.7%

Maximum Particle Size: Crs sand

Specific Gravity: 2.65

Shape (> #10): Rounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.5	0.5
#20	850	95.1	4.4
#40	425	84.4	10.7
#60	250	71.0	13.4
#80	180	34.8	36.2
#100	150	23.4	11.4
#200	75	10.5	12.9
Hydrometer	35.8	5.8	4.7
	22.9	4.5	1.3
	13.4	3.7	0.9
	9.5	2.5	1.2
	6.8	2.1	0.4
	3.3	1.6	0.5
V	1.4	0.8	0.8

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: J. B. S.

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436896

Sample ID: MR-SD-6-90

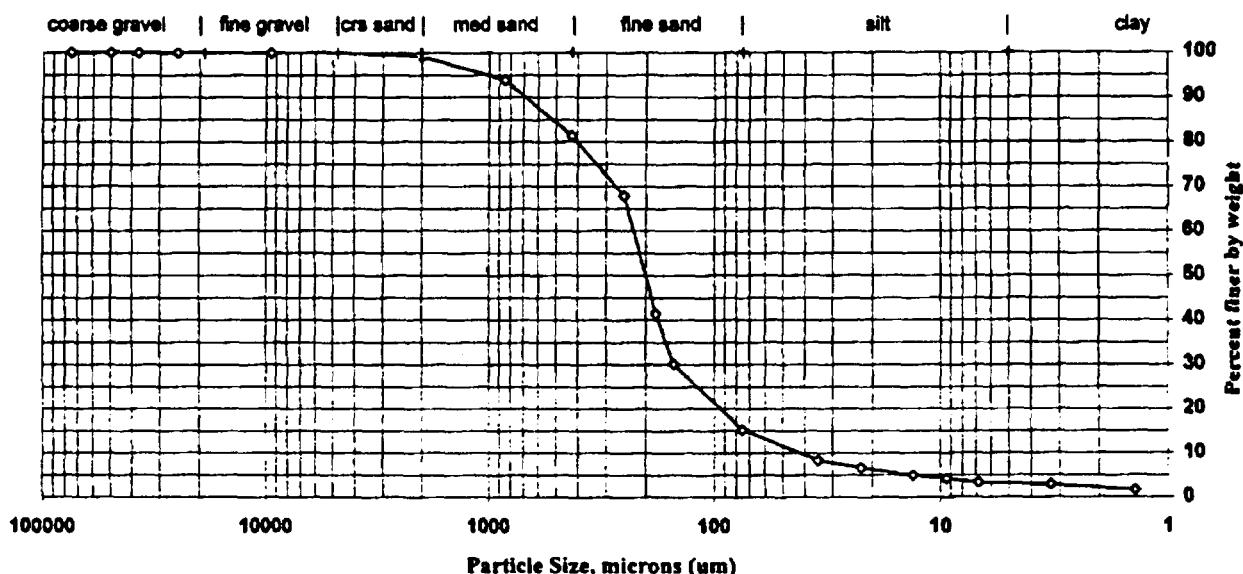
Percent Solids: 80.2%

Maximum Particle Size: Crs sand

Specific Gravity: 2.65

Shape (> #10): Rounded

Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.2	0.8
#20	850	93.9	5.2
#40	425	81.3	12.6
#60	250	67.9	13.5
#80	180	41.5	26.4
#100	150	30.1	11.3
#200	75	15.2	14.9
Hydrometer	34.7	8.3	6.9
	22.4	6.6	1.7
	13.2	4.9	1.7
	9.4	4.2	0.8
	6.8	3.3	0.8
	3.3	2.8	0.5
V	1.4	1.6	1.2

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

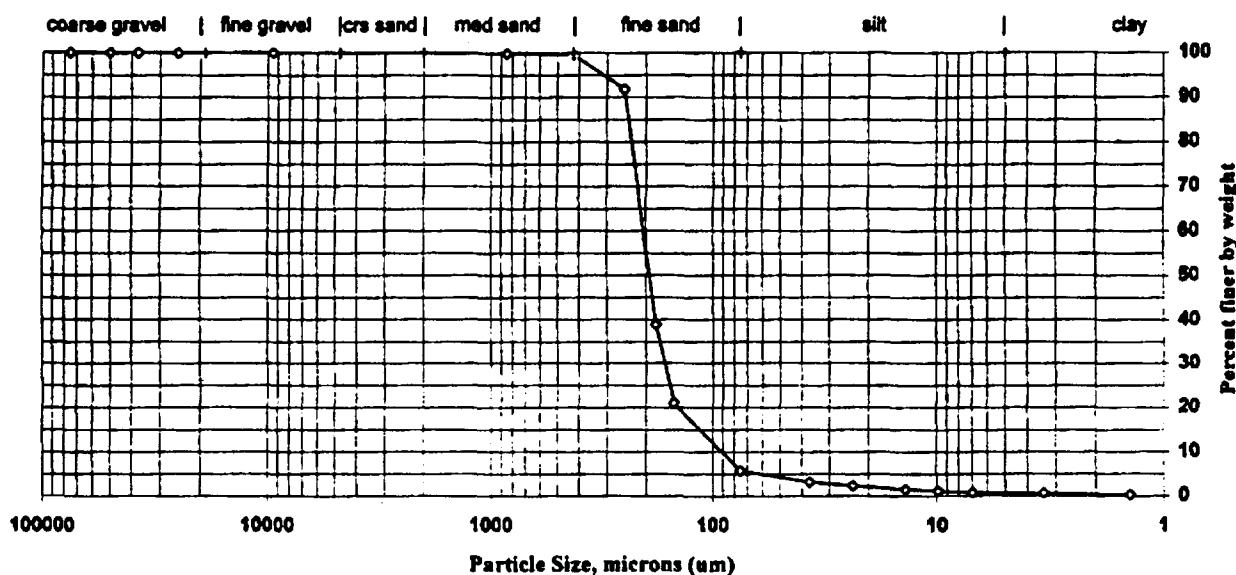
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLN C Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436897

Sample ID: MR-SD-5-1

Percent Solids: 81.6%
Specific Gravity: 2.65

Maximum Particle Size: Crs sand
Shape (> #10): Rounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	100.0	0.0
#20	850	99.9	0.1
#40	425	99.6	0.3
#60	250	91.7	7.9
#80	180	38.8	52.9
#100	150	21.0	17.8
#200	75	5.8	15.2
Hydrometer	36.8	3.2	2.6
	23.5	2.3	0.8
	13.7	1.5	0.8
	9.8	1.2	0.3
	7.0	0.8	0.4
	3.4	0.7	0.1
V	1.4	0.3	0.3

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: [Signature]

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

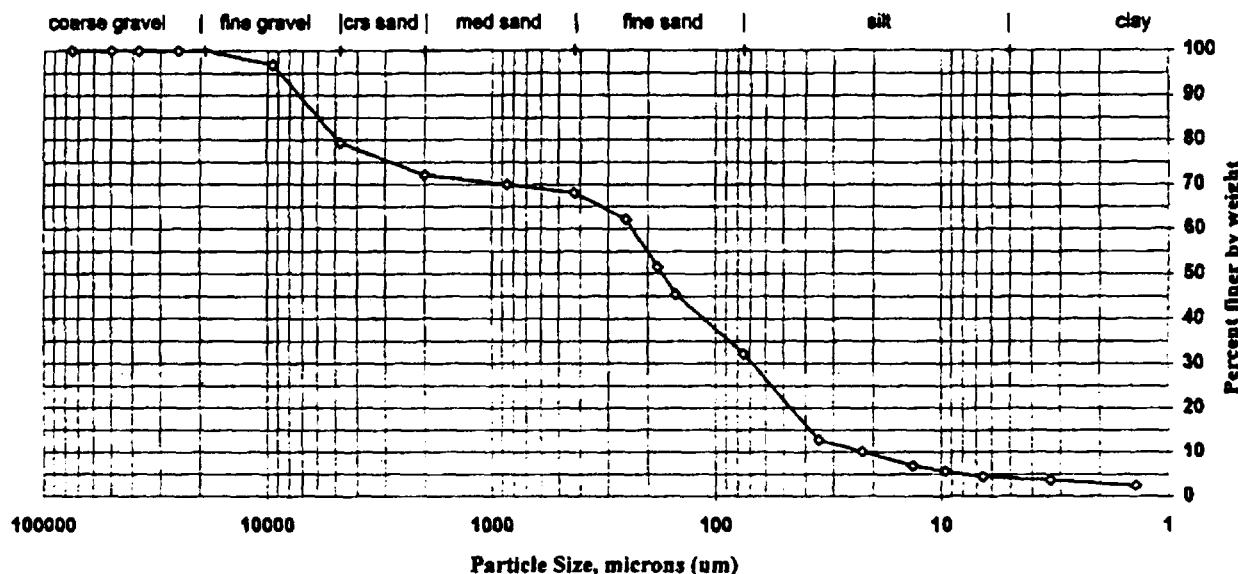
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436899

Sample ID: MR-SD-5-150

Percent Solids: 71.6%
Specific Gravity: 2.65

Maximum Particle Size: 19 mm
Shape (> #10): Rounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	96.9	3.1
#4	4750	79.3	17.6
#10	2000	72.2	7.1
#20	850	70.0	2.2
#40	425	68.1	2.0
#60	250	62.1	5.9
#80	180	51.5	10.6
#100	150	45.4	6.1
#200	75	32.2	13.2
Hydrometer	34.7	12.7	19.5
	22.4	10.1	2.6
	13.2	6.9	3.2
	9.6	5.7	1.2
	6.5	4.4	1.3
	3.3	3.7	0.8
V	1.4	2.5	1.2

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

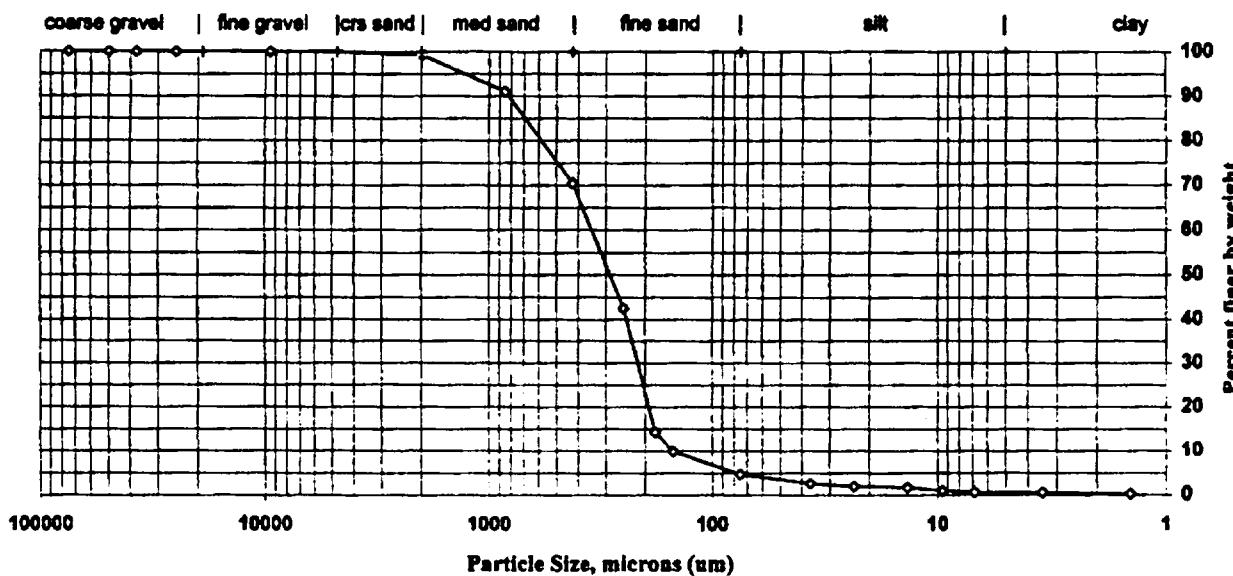
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436900

Sample ID: MR-SD-7-150

Percent Solids: 85.1%
Specific Gravity: 2.65

Maximum Particle Size: Crs sand
Shape (> #10): Rounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.2	0.8
#20	850	91.1	8.1
#40	425	70.4	20.6
#60	250	42.5	27.9
#80	180	14.3	28.2
#100	150	9.9	4.4
#200	75	4.7	5.2
Hydrometer	36.6	2.7	2.1
	23.4	2.0	0.7
	13.5	1.6	0.3
	9.5	1.0	0.7
	6.9	0.6	0.3
	3.5	0.6	0.1
V	1.4	0.2	0.3

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

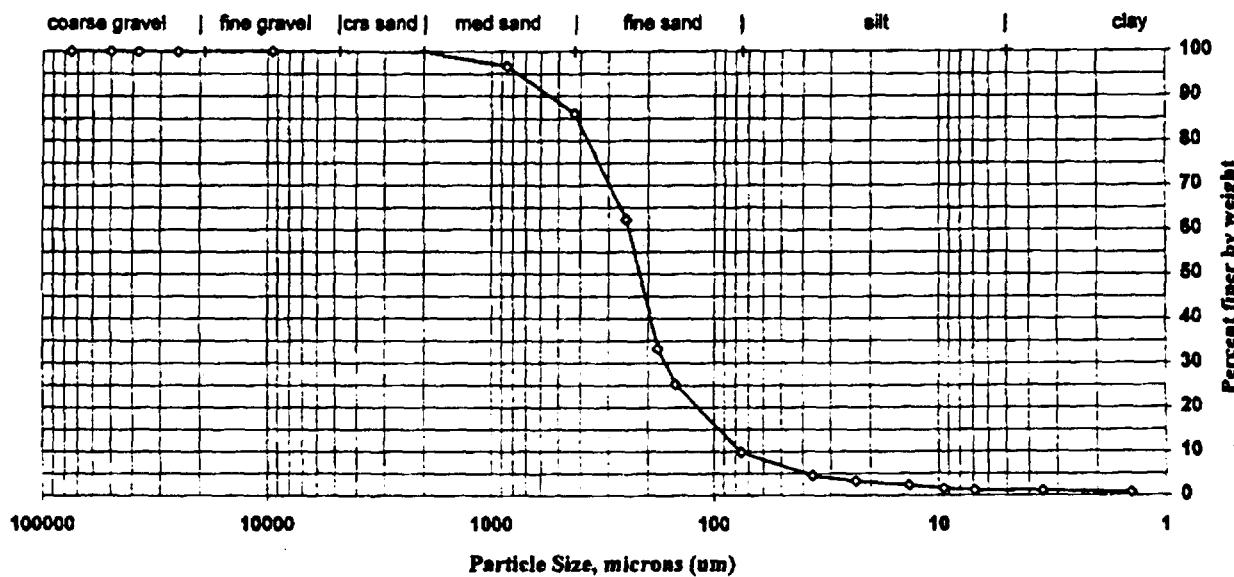
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80561
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 09-Nov-00 Start Date: 28-Nov-00 End Date: 01-Dec-00

Lab ID: 436902

Sample ID: MR-SD-7-45

Percent Solids: 83.3%
Specific Gravity: 2.65

Maximum Particle Size: Crs sand
Shape (> #10): Rounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	100.0	0.0
#10	2000	99.8	0.2
#20	850	96.7	3.2
#40	425	86.1	10.6
#60	250	62.3	23.8
#80	180	33.2	29.0
#100	150	25.3	7.9
#200	75	9.8	15.5
Hydrometer	36.1	4.4	5.4
-	23.1	3.2	1.2
-	13.5	2.4	0.8
-	9.5	1.6	0.8
-	6.9	1.2	0.4
-	3.5	1.1	0.1
V	1.4	0.7	0.4

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By: D. K. R.

Date: 12/1/00

STL - Burlington 80561ps::Report

Particle Size of Soils by ASTM D422

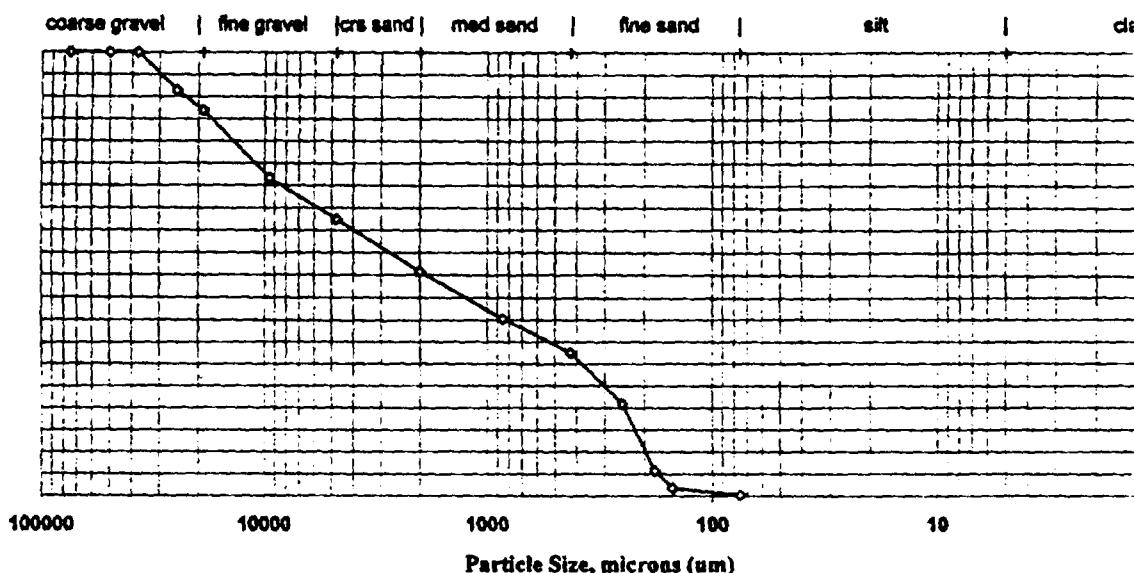
Sample preparation by: D2217
 Client: STL North Canton Project No.: 20000 ETR(s) #: 80506-07-16-61-18
 Client Code: STLNC Job No.: 20000 SDG(s): 80506
 Date Received: 06-Nov-00 Start Date: 27-Nov-00 End Date: 28-Nov-00

Lab ID: 436898

Sample ID: MR-SD-5-315

Percent Solids: 89.4%
 Specific Gravity: 2.65

Maximum Particle Size: 37.5 mm
 Shape (> #10): Subrounded
 Hardness (> #10): Hard



Sieve size	Particle size, μm	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	91.4	8.6
3/4 inch	19000	86.9	4.6
3/8 inch	9500	71.6	15.3
#4	4750	62.4	9.2
#10	2000	50.7	11.7
#20	850	40.3	10.4
#40	425	32.5	7.8
#60	250	21.0	11.6
#80	180	5.7	15.2
#100	150	1.8	3.9
#200	75	0.2	1.6
Hydrometer	0.0	0.0	0.2
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
—	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil
for hydrometer test
by mechanical mixer
with metal paddle,
operated for at least
one minute within a
dispersion cup with
125 mls sodium
hexametaphosphate

Submitted By:

Date: 12/1/00

STL - Burlington 80506so::Repo

Particle Size of Soils by ASTM D422

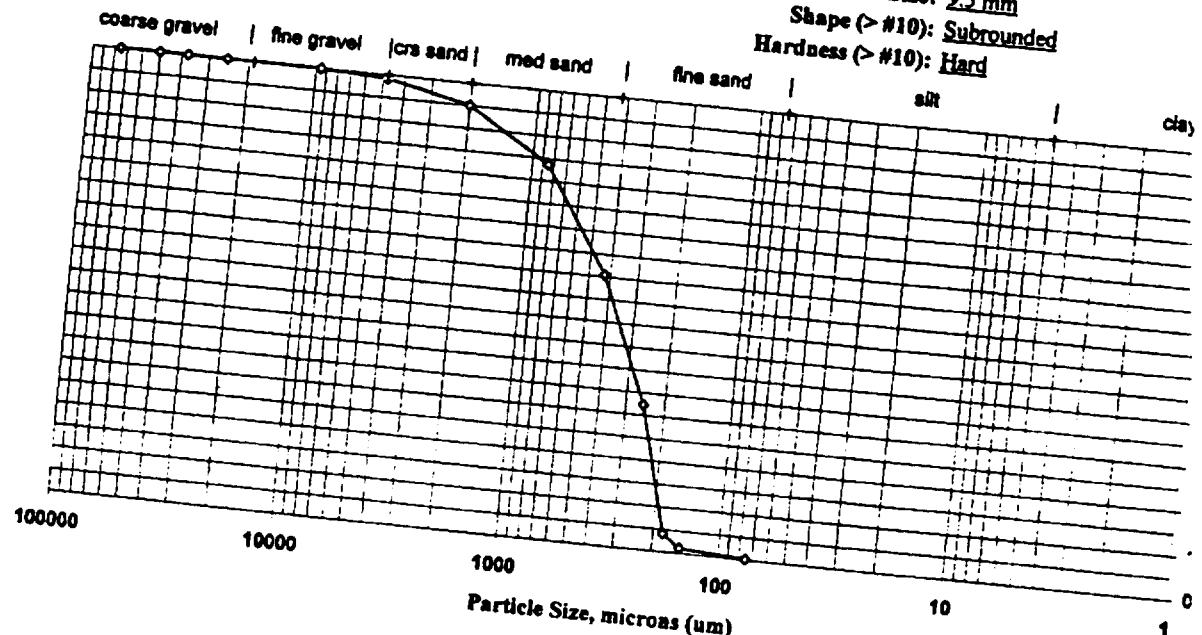
Client: STL North Canton Sample preparation by: D2217
 Client Code: STLNC Project No.: 20000
 Date Received: 06-Nov-00 Job No.: 20000
 Start Date: 27-Nov-00 ETR(s) #: 80506-07-16-61-18
 SDG(s): 80506 End Date: 28-Nov-00

Lab ID: 436901

Sample ID: MR-SD-7-280

Percent Solids: 36.1%
Specific Gravity: 2.65

Maximum Particle Size: 9.5 mm
Shape (> #10): Subrounded
Hardness (> #10): Hard



Sieve size	Particle size, um	Percent finer	Incremental percent
3 inch	75000	100.0	0.0
2 inch	50000	100.0	0.0
1.5 inch	37500	100.0	0.0
1 inch	25000	100.0	0.0
3/4 inch	19000	100.0	0.0
3/8 inch	9500	100.0	0.0
#4	4750	99.2	0.8
#10	2000	95.0	4.2
#20	850	83.7	11.4
#40	425	60.5	23.2
#60	250	32.3	28.1
#80	180	4.1	28.3
#100	150	1.2	2.9
#200	75	0.1	1.1
Hydrometer	0.0	0.0	0.1
/	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
/	0.0	0.0	0.0
V	0.0	0.0	0.0

Dispersion of soil for hydrometer test by mechanical mixer with metal paddle, operated for at least one minute within a dispersion cup with 125 mls sodium hexametaphosphate

Submitted By:

[Signature]

Date: 12/1/00

STL - Burlington 80506so::Report